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M. Smith.

RUSCHENBERGER'S SERIES.

FIRST BOOKS OF NATURAL HISTORY.

ELEMENTS OF ORNITHOLOGY:

PREPARED FOR THE USE OF

SCHOOLS AND COLLEGES,

BY

W. S. W. RUSCHENBERGER, M.D.

Surgeon in the U. S. Navy; Fellow of the College of Physicians; Hon. Member of the Philadelphia Medical Society; Member of the Academy of Natural Sciences of Philadelphia, &c. &c.

FROM THE TEXT OF

MILNE EDWARDS, AND ACHILLE COMTÉ,

PROFESSORS OF NATURAL HISTORY IN THE COLLEGES
OF HENRI IV, AND CHARLEMAGNE.

WITH PLATES.

PHILADELPHIA:
GRIGG & ELLIOT,
NO. 9 NORTH FOURTH STREET,
844.

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RECOMMENDATORY NOTICES.

OPINION OF WILLIAM S. ZANTZINGER, M.D.

Messrs. Turner and Fisher :—

The flattering reception which the previous volumes of Dr. Ruschenberger's Series have met with from the public, has already proved that his efforts to diffuse a taste for the study of Natural History, especially among the younger members of the community, and the means selected for the purpose have been fully appreciated. Any commendation of the present number of the Series, "*The Elements of Botany*," would therefore seem almost superfluous.

It is certainly admirably adapted for "beginners, whether young or old," containing a large amount of information in a small compass, and easy of comprehension.

WILLIAM S. ZANTZINGER, M.D.

Philadelphia, April 25, 1844.

OPINION OF SAMUEL GEORGE MORTON,

Professor of Anatomy and Physiology, Pennsylvania Medical College.

Messrs. Turner and Fisher :—

I have carefully examined the *Elements of Botany*, constituting part of Dr. Ruschenberger's Series of "First Books of Natural History," and am highly pleased with the plan and details of the work. It appears to combine whatever is requisite in elementary science, and is well calculated to mingle pleasure and instruction in the mind of the learner.

SAMUEL GEORGE MORTON, M.D.

May 7, 1844.

OPINION OF THOS. D. MÜTTER, M.D.

Professor of the Institutes and Practice of Surgery, in the Jefferson Medical College, Phila.

Messrs. Turner and Fisher :—

Gentlemen, — I have just examined the "*Elements of Botany*," by Dr. Ruschenberger, and heartily recommend the work to the notice of all who desire information on the subject of which it treats. Like the previous numbers of the Series, it fully sustains the high reputation of its author.

Respectfully, yours, &c.

THOS. D. MÜTTER, M.D.

OPINION OF JOSEPH CARSON, M.D.

Professor of Materia Medica in the Philadelphia College of Pharmacy.

To Messrs. Turner and Fisher :—

I have examined the "*Elements of Botany*," belonging to Ruschenberger's Series, and regard it as the best book of the kind that has fallen under my observation. The descriptions are accurate; and, as every thing required by the learner is presented succinctly and lucidly, a full knowledge of rudimentary Botany may be obtained from it. As a pocket volume, it will be of advantage to the adept, who has occasion often to refresh his memory upon first principles. Even the general reader may derive information from the account of plants employed in the arts, or affording articles of luxury. Modest as is the form of this little production, it is endowed with high merit, and cannot fail to be useful to the public, by whom it will be appreciated.

Very sincerely, &c.

J. CARSON.

Philadelphia, April 18, 1844.

OPINION OF ROBERT BRIDGES, M.D.

Lecturer on Chemistry.

Messrs. Turner and Fisher :—

Gentlemen,—I have read and examined somewhat in detail the "*Elements of Botany*," by Dr. Ruschenberger, and can state with pleasure that it is calculated to sustain the reputation of the Series of "First Books," of which it constitutes a part.

Very respectfully, yours, &c.

ROBERT BRIDGES.

Philadelphia, April 20, 1844.

RECOMMENDATORY NOTICES.

OPINION OF THE RIGHT REV. CHAS. P. McILVAINE, D. D.

Bishop of the Protestant Episcopal Church, Diocese of Ohio; President of Kenyon College, &c.

Kenyon College, Gambier, Ohio, Feb. 1842.

MESSRS. TURNER & FISHER:

Gentlemen,—On reaching home, after a long absence, I had the pleasure of reciving the copy of the work prepared by Dr. Ruschenberger on Physiology and Animal Mechanism, for the use of schools. If my opinion of its merits can be of any service to its circulation, I am free to say that not only are the subjects of the work such as ought to enter into the course of study of the higher classes of our schools, but this work seems to me to be well adapted to the want of schools in reference to its subjects. At any rate, I know not a better for its professed purposes.

Yours, very truly, and respectfully,
CHAS. P. McILVAINE.

OPINION OF THE HON. LEVI WOODBURY,

United States Senator from New Hampshire.

Washington, 28th Jan. 1842.

MESSRS. TURNER & FISHER.

Gentlemen,—Yours of the 22d inst, has been received, with the First and Second Book on Natural History, which you have recently published.

I have examined them with some care and appreciate the plan of communicating the elements of this interesting branch of science in so cheap and clear a form.

With my best wishes for the success of your enterprise,

I am, respectfully,
LEVI WOODBURY.

OPINION OF THE HON. DANIEL STURGEON,

United States Senator from Pennsylvania.

Senate Chamber, Washington-City, Jan. 29th, 1842.

MESSRS. TURNER & FISHER.

Gentlemen,—I have examined with some care the two small volumes you were so kind as to send me.

I think Dr. Ruschenberger has succeeded in condensing into as small a space as possible, much valuable information on the subject of which he treats, and think the work admirably calculated to impart general knowledge on this interesting subject.

I will be pleased to see it adopted in our high schools and colleges as a text book.

With sentiments of respect and esteem, yours,
DAN'L STURGEON.

OPINION OF THE HON. SAMUEL L. SOUTHARD,

United States Senator from New Jersey.

Washington, Feb. 15th. 1842.

MESSRS. TURNER & FISHER.

Dear Sirs,—I am gratified by your kindness, in sending me the two volumes referred to, in your letter of the 31st of January. I entirely concur in the objects you desire to accomplish. Few things can be more important to our common country. My incessant and inexorable duties, have, thus far, prevented me from making that examination of the volumes which I desire.

I am respectfully, &c. &c.
SAMUEL L. SOUTHARD

RECOMMENDATORY NOTICES.

OPINION OF GEORGE M'CLELLAN, M. D.

Professor of the Institutes and Practice of Surgery, in the Pennsylvania College of Medicine.

Messrs. Turner & Fisher.

I have examined the two first of the Series of Dr. Ruschenberger's First Books of Natural History, with much attention, and take great pleasure in giving my opinion in their favour. They are admirably calculated to diffuse a sound knowledge of first principles in the sciences. They are *axiomatic* in their design and character, and are constructed on the true principles of inductive philosophy. The general propositions all comprehend true minor ones, and also the individual facts. They appear to me to have been drawn up according to Bacon's strictest method of exclusions and rejections. I have made the first of the series a text book in my private class; and have found it to facilitate the business of communicating an accurate and precise knowledge to the best educated among the students of medicine and surgery.

GEORGE M'CLELLAN.

Philadelphia, March 7. 1842.

OPINION OF THO'S D. MÜTTER, M. D.,

Professor of the Institutes and Practice of Surgery, in the Jefferson Medical College, Philadelphia.

Philadelphia, Jan. 18, 1842.

Dr. Ruschenberger.

Dear Dr.—I have carefully examined the "Second Book" of your very valuable series on "Natural History," and cordially unite with many others in bearing testimony to its merits.

The study of Natural Sciences has been too much neglected in our "systems of education," and nothing can remedy the evil but the publications by individuals whose reputations will be a sufficient guarantee to the public as to the value of their labours of well arranged, lucid, and at the same time scientific works upon these subjects. I need hardly say that the series now under issue, possesses all the attributes of success.

Very faithfully, yours,
THO'S D. MÜTTER.

OPINION OF ROBERT M. BIRD, M. D.

Professor of Materia Medica, and the Institutes of Medicine, in the Pennsylvania College of Medicine.

Philadelphia, February 21, 1842.

My Dear Doctor,

After a very careful examination of your *Mammalogy*, or *Second Book of Natural History*, from the text of Edwards and Comte, it affords me pleasure to bear witness to its merits. It is, like the First Book of the Series, on Physiology and Animal Mechanism, extremely well adapted to the purpose for which it was written, of opening to the pupils of our higher schools and colleges, the great field of Natural History, and grounding them in the principles of classification, while imbuing them with a love of the science and the introduction of such works into our schools, cannot be otherwise than favourable to the interests of education.

Very respectfully yours, &c,
ROBERT M. BIRD.

W. S. W. Ruschenberger, M. D.

RECOMMENDATORY NOTICES.

OPINION OF THE HON. G. C. VERPLANCK.

Late United States Senator from New York; and now one of the Trustees the Public Schools.

New York, Feb. 7, 1842.

Messrs. Turner & Fisher.

Gentlemen,—I find among other papers which my absence from the city has occasioned me to neglect, a note from you accompanying Dr. Ruschenberger's little work on Natural History, which was received on the day I left town for an absence of some time.

I have since examined the volume with much pleasure. I think it exceedingly well executed, communicating much information in an unpretending manner, and calculated to be very useful and acceptable to those for whom it is specially designed. I am, your ob'dt serv't,

G. C. VERPLANCK.

OPINION OF S. S. HALDEMAN, ESQ.

Zoologist and Lecturer on Zoology.

Philadelphia, February, 1842.

Messrs. Turner & Fisher.

I have seen no work of the same extent, which contains so much useful matter on Zoology, as the "Elements" of Milne Edwards; and Dr. Ruschenberger deserves the thanks of the public for making it the basis of of his Zoological volumes. His additions to the part devoted to "Mammalogy," are judicious; and his constant adherence to the true, or scientific names of animals, is a step to which the authors of elementary works seldom advance. For this feature, and the glossary of technical terms, the student will be greatly indebted to him. I can confidently recommend the "Mammalogy" as better calculated to fulfil the objects intended, than any other work with which I am acquainted. Yours, &c.

S. S. HALDEMAN.

OPINION J. AUGUSTINE SMITH, M. D.

President of the College of Physicians and Surgeons, and Professor of Physiology, Crosby Street School.

No. 5 Carroll Place, New York, Jan. 20, 1842.

Messrs. Turner & Fisher.

Gentlemen,—I have received and examined your "Second Book of Natural History, prepared by Dr. Ruschenberger," and I can truly say I am acquainted with no work of the same size containing an equal amount of useful, accurate, and entertaining knowledge. I therefore hope and believe it will not fail to receive the encouragement extended to the first volume of the series. Respectfully, your ob't serv't,

J. AUGUSTINE SMITH.

OPINION OF ALBAN GOLDSMITH, M. D.

New York, Jan. 17, 1842.

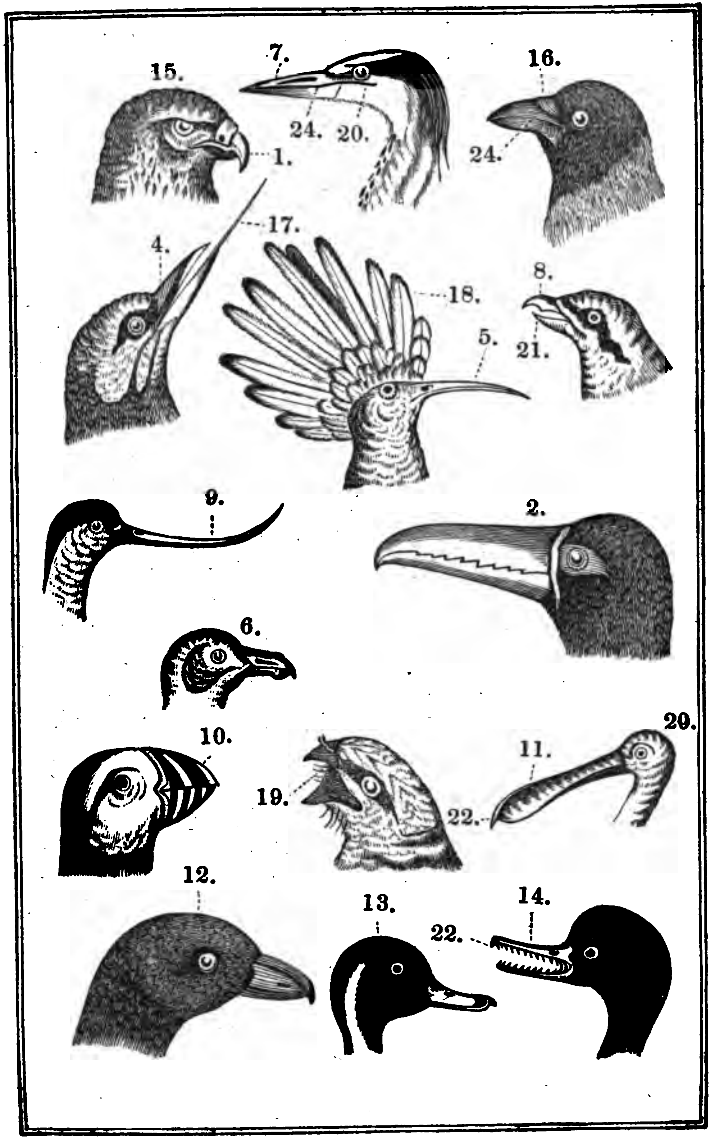
Messrs. Turner & Fisher.

Gentlemen,—I have received your Second Book of Natural History, prepared for the use of schools. I am very much pleased to hear that your First Book has been adopted by the Public Schools in Pennsylvania, and I trust the example will soon be followed by all the States of the Union, for nothing expands the mind so much as the book of Nature. And I look upon the introduction of the study of Natural History into common schools as a bright spot in the progress of mental culture.

Yours, truly,

ALBAN GOLDSMITH.

Plate 8.



Anatomy.—Beaks.

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WITH PLATES.

PHILADELPHIA:
GRIGG & ELLIOT,
NO. 9 NORTH FOURTH STREET.
1845.

Entered, according to the Act of Congress, in the year 1842, by
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ORNITHOLOGY.

PREFACE.

The following Primer, or First Book of Ornithology, has been called "Third Book of Natural History," because it is the third of the series, and, like its predecessors, is only designed to initiate those who wish to study this very interesting branch of Natural History. It presents a general, and almost synoptical view of the subject, and will be found, I hope, to facilitate the studies of those who may wish to learn. It merely points the way to more extended knowledge, the acquisition of which must always depend more on the inclination and industry of the student, than upon the facilities he may possess. The homely comparison of the horse lead to the stream may be referred to as illustrative of the necessity for the presence of zeal and industry, in order to acquire knowledge:—the mere possession of the very best books will be of no use,—will impart no information, unless they be referred to, read, or studied.

Teachers who are so disposed, will find in these pages, ample opportunities of pointing out to those they instruct, the beautiful adaptation of the organization of every living thing, to the mode of life it is designed to observe, and the kind of food upon which it was pre-ordered it should live. To point out, or even allude to this universal adaptation of every thing in nature, to the puposes for which it was designed by the beneficent Creator, would have carried us far beyond our limits, and injured our design of presenting, in a very short space, as many facts as possible, without obscuring the view of the division, arrangement, or classification, a knowledge of which it is the great object of these little books to teach. Yet, this can be advantageously done verbally, by every teacher, and his pupils will soon learn that once becoming acquainted with the general anatomy and physiology of an animal, whether it walk upon the dry land, float through the air, or seek the ocean depths, its mode of life and general habits are immediately discovered. This fact will become more clearly manifest as we proceed in the series, and in the end, the student will comprehend how Geologists are able to deduce, not only the habits of the animal, but also the form of the animal itself, by the examination of only a few of its bones.

PREFACE.

Although the works of M.M. Edwards and Comte are the chief sources from which the materials of these Primers have been derived, others have been freely used, and the classification and arrangement of the great Cuvier, have been strictly adhered to.

With the view of assisting the student in understanding and remembering the systematic names, their etymologies have been added in the Glossary. And, in as much as all persons who are desirous of studying Natural History, are not acquainted with the Latin and Greek languages, the words from the latter have been given in *italics*, in preference to using the proper Greek characters, and the omega, where it occurs, has been designated thus, *ô*.

It is not designed that the questions at the foot of the page shall be answered by repeating the text from memory; the pupil should be able to give the facts in his own language, and show he understands the subject.

The Plates were engraved by Mr. G. Thomas, No. 37 South Third Street, Philadelphia.

Philadelphia, April 15th, 1842.

ORNITHOLOGY.

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ORNITHOLOGY:

THE NATURAL HISTORY OF BIRDS.

LESSON I.

CLASS OF BIRDS.—*Zoological Characters of Birds.—Peculiarities of their Organization.*

GENERAL NOTIONS ABOUT BIRDS.

Of the Organization of Birds.

1. THE CLASS OF BIRDS comprises all vertebrate animals that are the best organized for flying. They are readily distinguished by the general form of the body, and by the feathers with which they are covered; but the most important characters possessed by them, consist in the structure of their internal organs, and the manner in which their various functions are performed.

2. In fact, they are *oviparous vertebrata, in which the circulation is double and complete: the heart has four cavities; the blood is warm, and the respiration is aerial, and double.*

3. To distinguish them from other vertebrate animals, it is only necessary to say, they have *a complete circulation* and *a double aerial respiration*; or simply to remember that they are the only *oviparous vertebrata having warm blood.*

4. The general form of birds varies very little, and is in relation to the mode of locomotion which is peculiar to them. They rarely attain a very large size, and their abdominal or posterior extremities are especially designed for standing and walking,

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1. What animals compose the class of birds? By what characters are birds readily distinguished from other animals? In what important particulars do birds differ from other animals?

2. What are birds? What is the character of the circulation in birds? How many cavities has the heart? Are birds cold blooded animals? What is the character of the respiration in birds?

3. How are birds distinguished from other vertebrate animals?

4. What is remarked of the general form of birds? To what purposes are the lower extremities of birds applied? What are the functions performed by their superior, or thoracic extremities? What are these extremities called?

while the thoracic or anterior extremities never serve them for walking, nor for prehension, nor for touch; but they form a sort of broad oars, named *wings*, which, by striking the air, sustain and cause the animal to move in it.

5. The SKELETON, (*Plate* 1, *fig.* 1.) which determines the general form of the body, and which is, at the same time, one of the most important parts of the apparatus of motion, is composed of nearly the same bones as that of the mammalia; but their form and disposition vary.

6. The *head* is small, the bones of the cranium are soldered together at an early period of life, and the face is formed almost entirely by the jaws which are very much elongated and constitute a beak. The superior mandible or jaw is articulated with the cranium, in such a manner as to allow some mobility, and the lower mandible, in place of being articulated directly with the cranium, as is the case in mammalia, is suspended from a moveable bone, called the *square* or *tympanic bone*, which is articulated with the *petrous* bone; [this mode of articulation of the lower jaw is met with also in other oviparous vertebrate animals, that is, in fishes and reptiles] These mandibles are composed of many pieces, and are enveloped in a horny substance which takes the place of teeth.

7. The articulation of the head with the vertebral column is much more moveable than it is in mammals, and is effected through the means of a single rounded eminence, (called condyle,) while in the mammalia there are always two of these condyles. This arrangement enables the bird to direct his face entirely and completely backwards.

8. The neck of birds is also very moveable; and as these animals generally take their food from the ground with their beak, the length of this part of their body is necessarily in proportion to the height at which they are placed on their legs. This is in-

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5. In what respect does the skeleton of birds differ from that of mammals?

6. What is remarked of the head of birds? What forms the face? How does the articulation of the upper jaw with the cranium differ in birds, from the same articulation in the mammalia? What is the peculiarity of the articulation of the lower jaw in birds? With what bone does the *square-bone* articulate? Is this mode of articulation of the lower jaw peculiar to birds? How are these mandibles composed?

7. What is the peculiarity of the articulation of the head (of birds) with the vertebral column? What is the advantage resulting from this arrangement?

8. Upon what circumstances does the length of the neck seem to depend? What is the most common number of cervical vertebræ in birds? How many cervical vertebræ has the Swan? How many has the Sparrow? Are the bones of the neck very moveable on each other?

deed almost always observed. The number of cervical vertebræ varies much; most generally there are twelve or fifteen; but sometimes we find a much larger number, and at others, not so many; the Swan has twenty-three, and the Sparrow only nine. These bones are always very moveable on each other, and from the disposition of their articular surfaces, the neck may be bent like the letter S, and, consequently, be elongated or shortened accordingly as the curves are diminished or increased.

9. The bony frame of the *trunk* is very solid; in birds that fly, (and with the exception of a very few, they all possess this faculty,) the vertebræ of the back, which necessarily support the ribs, and consequently afford a point of support for the wings, are entirely immoveable and are frequently anchylosed, that is, soldered together; the lumbar and sacral vertebræ are all united into one bone, having the same uses as the sacrum in the mammalia: finally, the coccygian vertebræ are small and moveable; the last one, which sustains the large tail feathers, is ordinarily larger than the others and marked by a projecting spine or crest.

10. The ribs of birds also possess some peculiarities of structure which tend to increase the strength of the thorax; but the most remarkable part of the bony frame of this division of the body is the sternum, which, affording points of origin for the chief muscles of flight, becomes very much developed, and constitues a broad shield or breast-plate, which extends far back over the abdomen, and almost always presents a sort of very prominent and longitudinal crest or keel, called *brisket.* (*Plate* 1, *fig.* 2.) It is remarked that this shield is most developed and most completely ossified in those birds that fly best.

11. The bones of the shoulders are disposed in a manner most favourable for the power of the wings; they are three in number, namely; a *Scàpula*, a *Clavicle*, and a *Coracoid Bone.* The Scapula is much elongated; the Clavicle is anchylosed with that of the opposite side, so as to form a bone resembling in shape, the letter V, the point of which rests against the Sternum; the Coracoid bone, or posterior clavicle, is a sort of second clavicle, which, in the mammalia, is rudimentary and confounded with the Scapula, but here becomes very strong, consituting a buttress placed between the articulation of the shoulder.and the sternum.

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9. What is remarked of the skeleton of the trunk? Are the vertebræ of the spinal column moveable on each other?

10. What is remarkable of the sternum of birds? What is the brisket? What renders it necessary that the sternum should be large?

11. How many bones belong to the shoulder? What are they? What is the form and situation of the clavicle? What is the coracoid bone? What is its situation? What is the advantage derived from the double clavicles in birds?

These double clavicles maintain the shoulders apart in spite of the violent force applied in a contrary direction by the exercise of the wings, which is greater the stronger the flight.

12. The wing of the bird corresponds to the anterior extremity of mammals, and is also composed of three principal parts, namely: the arm, the fore-arm, and the hand. The arm consists of a humerus which is not particularly remarkable; the fore-arm which consists of a radius and an ulna, corresponds in its length with the strength of the flight of the bird; and the hand is reduced to a sort of stump, which serves for the insertion of the large feathers of the wing: there is distinguished a range of carpal bones, a bone in the form of a style which represents the thumb, a single metacarpal bone sustains a finger with two phalanges, and the vestiges of a third finger which is represented by a small styloid bone.

13. The lower extremities of birds are designed solely for support and for walking; sometimes they become the organs of natation, and there are some of these animals that employ them for the prehension of aliment. The bones of the haunches are strongly developed; they are attached to the neighbouring part of the vertebral column, so as to form with it a single piece, and the bony belt which results from this assemblage, and which is called the pelvis, remains almost always incomplete in front. The femur is short and directed forward; the tibia is strong, and the fibula is reduced to a mere bony style. The tarsus and metatarsus are represented by a single bone, the length of which determines the height of the bird on its legs. The number of toes varies from four to two; almost always there are three directed forward and one backwards. The number of phalanges ordinarily increases from two to five, from the hind toe or thumb, to the fourth toe. We therefore count two phalanges for the thumb or great toe, three for the internal toe, four for the middle toe, and five for the external.

14. In swimming birds the toes are *palmate*, that is, united by membranes sufficiently broad to allow them to separate from each other, and when spread, to form a sort of paddle. In those that

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12. How does the wing of a bird differ from the anterior extremity of a mammal? How does the hand resemble that of a mammal?

13. To what purposes are the lower extremities applied? How does the pelvis of birds differ from that of mammals? Is the fibula complete in birds? How are the tarsus and metatarsus formed? What is the number of toes? How many phalanges have the toes?

14. How are the feet of swimming birds characterised? What is remarkable in the feet of climbing birds? How are the feet of wading birds distinguished? How is it that birds can sleep while standing on the limbs of trees without falling?

climb best, two toes are directed forward and two backwards; and in those that wade in rivers, marshes, &c., in search of fishes or worms, the tarsi are so long that the animal seems to be mounted on stilts. In all these animals there is a peculiar mechanism, by means of which, when they are perched upon a branch, the weight of the body tends to flex their toes, and consequently to make them closely embrace the object in their grasp; an arrangement which permits them to repose in the standing position without any risk of falling while asleep.

15. The *feathers* with which the body of birds is covered, serve to protect them against cold and damp; and they are also powerful means of locomotion. They are composed of a horny stalk, hollow at the base, and armed with beards, which themselves, have still smaller beards upon them: they are formed by secreting organs which are analogous in their nature to those which produce the hairs in mammalia. [The secreting organ destined to form a feather is called a *capsule*, and often acquires considerable length. According to the observations of M. F. Cuvier, it would appear that the capsule grows during the whole period occupied in the developement of the feather, and that in proportion as its base elongates, its extremity dies and becomes dry, the moment it has formed the corresponding portion of this appendix. Each one of these little apparatuses is composed of a cylindrical sheath, lined internally by two coats or tunics, united by oblique partitions, and a central bulb. The substance of the feather is deposited on the bulb, and to form the beards, it is moulded in some way, in the spaces that the little partitions, we have just mentioned, leave between them; in the portion corresponding to the stalk, the bulb is in relation with the internal surface of the stalk, and after having there deposited a spongy substance it dries and perishes: but at the part where the stalk or trunk of the feather is tubular, the lamina of horny matter which this secreting organ deposites, is shaped or moulded around itself, and is completely enveloped in it; nevertheless, the bulb, after it has discharged its functions, dries, and forms, in perishing, a series of membranous cones, lodged one in the other like a nest of boxes, which fill the interior of the tube, and are called *the soul of the feather, or quill.*

16. The new feather is at first enclosed in the sheath of its capsule which frequently projects several inches beyond the skin, and is gradually destroyed; the feather then appears naked, and its beards display themselves laterally; the extremity of its

15. What are the uses of the feathers? How are they formed?
16. Do birds shed their feathers?

tube remains bedded in the skin, but is generally detached without difficulty, and at a certain period falls to give place to a new feather. This renewing of the feathers, which is called *moulting*, occurs, in general, every year after the season of laying; and sometimes it takes place twice in the year, in the spring and the autumn; it happens earlier in the old than in the young, and is a period of indisposition during which the bird usually loses its voice.

17. The form of these tegumentary appendages varies much; some are destitute of beards and resemble the spines of the porcupine; others have stiff beards which are armed with smaller beards which hook into each other, so as to form a great tissue or coat, which the air does not penetrate; others again have the beards and the smaller beards (barbs and barbules) long, flexible, and not hooked into each other, which renders them extremely soft and light; and there are some which resemble simple down. Their colours are infinitely varied and often surpass the most beautiful flowers or the most brilliant gems in beauty and splendour. Generally, the plumage of the female is not so rich as that of the male, and it is rare for the young bird to be clothed in the same colours that it will wear all its life; they often change two or three years afterwards, and sometimes the adult wears a plumage in the spring, altogether different from that of winter.]

18. The large stiff feathers that grow on the anterior extremities of birds, which are called *wing feathers*, or pinion feathers, expand these organs very considerably without increasing their weight, and convert them into powerful oars destined to cleave the air, and strike against it with so much force and frequency, that the shock thus produced impels the body of the animal in a contrary direction. The ability of the bird to sustain itself in the air, and move with rapidity, is in proportion to the expanse of the wings. The feathers which contribute most to the extent of the wings, and that are most useful in flight, are those which are attached to the hand, and, consequently, most distant from the body; they are always ten in number, and are called *primary remiges;* the feathers of the fore-arm are called *secondary remiges;* the *scapulary*, which are the least in strength, are attached to the humerus; the *bastard feathers* are those that grow from the thumb, and the *coverts*, those feathers which cover the base of the remiges.

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17. Whether does the male or female bird possess the most brilliant colours? Are the colours of all birds the same throughout the year?

18. What are the primary remiges? What is their number? What are the secondary remiges? What are the scapulary feathers? What are bastard feathers or quills?

[Every time a bird wishes to strike the air, he first raises the humerus with the wing still folded; next he expands the wing extending the fore-arm and hand, and then suddenly depresses it; the air which resists this movement now affords him a point of support, upon which he rises: he launches himself forward like a projectile, and the moment an impulse is given to his body, he folds the wing to diminish as much as possible the new resistance which the ambient air opposes to his course. This resistance, and the attraction of gravitation, (which tends to cause all bodies to fall towards the centre of the earth,) gradually diminish the swiftness the bird has acquired by this blow or stroke upon the air, and if he made no new movement, he must soon descend, but if, before losing the swiftness acquired by the first blow of the wing, he gives a second, he will add a new impulse to that which he had already, and gain an accelerated movement. Such is, in fact, the mechanism of flight.

While the bird is thus suspended in the air, the whole weight of his body is supported by his wings, and to enable him to preserve his equilibrium in this position, the centre of gravity must be placed very nearly beneath the shoulders and as low as possible; it is for this reason that, while flying, he generally carries his head in advance by stretching out the neck, and that the body, instead of being elongated, like that of mammals, is always gathered up and oval. In this necessity for lowering, as much as possible, this centre of gravity, we also find the reason for a peculiarity of structure, which at first sight appears singular; the principal elevating muscles of the wings, instead of being placed upon the back, as is ordinarily the case in other animals, are found upon the chest with the depressors, and they produce an effect opposite to the latter, because their tendons pass over a sort of pulley before reaching the humerus; this arrangement is injurious to their action, but it has the advantage of accumulating, at the most depending part of the thorax, all the most weighty organs of the body, and, consequently of lowering thus far the centre of gravity.—(*See, First Book of Natural History, Page* 92.)

It is evident that the resistance of the air is in proportion to the mass of this fluid, struck at one time by the wings, and consequently, that the greater the surface of the wings, all things being equal, the greater will be the swiftness acquired by depressing these oars; hence it follows, that birds with long wings are not only able to fly with greater rapidity, than birds with short wings, but they are also able to support themselves for a longer time in the air, because they are not obliged to repeat the movements of these organs so frequently, and therefore do not become so readily fatigued: and, in fact, all birds remarkable for rapid and long sustained flight have large wings, while those that have short or moderate wings, compared with the volume of their body, fly less swiftly and require rest more frequently.

To rise vertically, it is necessary that the wings of the bird should be entirely horizontal, but this is not ordinarily the case; in general they are inclined from front to rear so as to impart to the animal an obliquely ascending movement; sometimes even this inclination is such, that, to mount nearly vertically, into the atmosphere, the bird is obliged to fly against the wind. The length of the remiges influences the facility with which he can rise in a calm air; birds that have the anterior remiges longest, and most resisting at their extremity, fly more obliquely, than those in which the wings are truncated at the end.]

19. The feathers of the tail also assist in flight, but in a different way; the bird makes use of them as a rudder to direct its course. The number of the feathers which perform this office is ordinarily twelve, and they are called *rectrices*, and the name of *coverts of the tail*, is given to those feathers which cover their base.

[We have seen that, during flight, the centre of gravity of the bird should be near the shoulders; in order that he may preserve his balance on his legs, which are placed near the posterior part of the trunk, these organs must be flexed considerably forward, and the toes must be sufficiently long, to be in advance of the point where the vertical line should fall that passes through the centre of gravity, or the centre of gravity must be carried behind, so as to be above the base of support. (*See First Book of Natural History, Page* 92.) This explains the utility of the great flexion of the thigh and the obliquity of the tarsus on the leg; when the foot is large and the neck can be bent so as to carry the head behind, the equilibrium is thus established without, the body being thrown much out of the horizontal position; but when the neck is short and toes of moderate length, the animal is obliged, while standing or walking, to assume an almost vertical position. It is for the purpose of more easily preserving their equilibrium, that birds generally place their heads under their wing, while they sleep, perched on one leg. In most of these animals this position is rendered singularly commodious by a peculiarity in the structure of the knee; in man and most animals, the extremities bend under the weight of the body the

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19. How do the feathers of the tail assist in flight? What are the rectrices? What is their number?

moment their extensor muscles cease to contract, and it continued contraction of these organs that renders standing fatiguing; but in the stork and other birds with long legs, it is otherwise; the lower extremity of the femur has a hollow or excavation which, during the extension of the limb, receives a projection of the tibia, which cannot escape from it without a muscular effort; the leg once in position, it remains extended, without the animal having any necessity to contract his muscles, and without his experiencing any fatigue.

20. The sense of touch in birds is necessarily dull, on account of the nature of their integuments. The sense of taste also appears to be obtuse in most of these animals: and in fact, their tongue is almost always hard and horny. In general, the same is true in respect to the sense of smell; sometimes, however, this sense appears to be very delicate; for we observe that birds of prey direct themselves by the odour alone to carrion, placed at too great a distance for them to perceive it, notwithstanding the great perfection of their sight.

21. Generally this last sense is more developed in birds than in all other animals. There is found at the back part of the eye a plaited membrane, called *pecten* or *marsupium*, which projects from the retina towards the crystalline lens, and seems to be of a nervous nature; it is also remarked that the anterior face of the ball of the eye is strengthened by a circle of bony pieces, lodged in the thickness of the sclerotica, and besides the two ordinary eyelids, there is always, at the external angle of the eye, a third, named *membrana nictitans*, (winking membrane,) which may be drawn over the front of this organ like a curtain.

22. Birds have not, like most mammals, an external ear; nocturnal birds only, have a large external concha or pavilion, but it is not projecting; and the opening of the ear is generally concealed by feathers with fringed beards.

23. The *brain* is less developed in birds than in most mammals, and differs from that of the latter in some important particulars, which we cannot enumerate at this time.

24. Finally, to conclude with the functions of relation, we will add, that in birds the voice is chiefly formed in the *inferior larynx*, which is situate at the extremity of the trachea, where it bifurcates to form the bronchia. (*Plate* 2, *fig.* 2.) In the singing birds this organ is very complicated in its structure; we

20. Why is the sense of touch dull in birds? Why is the sense of taste usually obtuse? Is the sense of smell very delicate?

21. In what particulars do the eyes of birds differ from those of mammals?

22. How does the organ of hearing in birds differ from that of mammals?

23. How does the brain of birds differ from that organ in other animals?

24. Where is the organ of voice situated in birds?

observe elastic membranes stretched in its interior and a great number of muscles, designed to move the solid pieces that compose it; but in those birds that do not modulate sounds, its structure is much more simple.

25. The organs destined to perform the various functions of nutrition are nearly the same as those in the mammalia.

26. The apparatus of digestion in the class of birds presents the greatest uniformity of structure: the most remarkable part of it is the existence of three stomachs. Teeth are never found in these animals; their aliments which are taken hold of by the beak, are generally swallowed without being divided; and do not sojourn or pause in the mouth, as is the case in mammals; they have no veil of the palate (*velum palati,*) to close this cavity behind during mastication. (*See, First Book of Natural History.*) The form of the beak varies much, and is always in relation to the nature of the food made use of by the bird; for this reason it affords excellent marks or characters for the classification of these animals. Sometimes the upper mandible is hooked and fitted for tearing flesh, at others the beak is short, straight and stout, suited to breaking grains; at other times again it is wide and very open, to enable the bird to seize easily in its flight, those insects upon which it is destined to feed.

27. The *tongue* is slightly fleshy, and covered with horny papillæ which serve to retain the food after it has entered the mouth. The os hyoides (hyoid bone) which supports this organ, is very much elongated, and terminates in two long delicate horns which curve round the posterior and superior part of the head, their length depending on the extensibility of the tongue. (*Plate* 1, *fig.* 3, *and Plate* 2, *fig.* 3.)

28. The *salivary glands* are less numerous than in the mammalia; all are placed beneath the tongue, and are formed of small round grains, or granules. Generally the saliva is thick and viscid.

29. The *œsophagus*, (*Plate* 2, *fig.* 4.) descends along the neck, and generally presents, at its inferior part, a considerable dilatation called the *crop* or *ingluvies:* this pouch constitutes a first stomach which projects above the clavicles; it is very large in granivorous birds and is met with in the *Rapaces* or birds of prey, but is wanting in the Ostrich, and in most piscivorous birds, and particularly those of the order of Grallatoriæ.

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25. Are the organs of nutrition in birds the same as in mammals?

26. In what particulars does the apparatus of digestion differ from that of mammals?

27. What are the characters of the tongue in birds?

28. Have birds salivary glands? What is the character of the saliva of birds?

29. What is the crop or *ingluvies?* Is a crop found in all birds?

30. Below the crop, the œsophagus becomes narrow and enters the thorax. Soon after entering the thorax it again dilates to form the second stomach, called *proventriculus*, or *bulbus glandulosus*. This cavity is remarkable for the great number of follicles which are lodged in the thickness of its parietes, and which secrete an acid liquid (the gastric juice) designed to effect digestion. This ventricle is much larger, and more numerously supplied with glands, in those birds that have no crop, than in those that are provided with it. Internally, it opens into a third stomach, the *gizzard*, which is of a globular form, and varies in structure according to the diet or food of these animals. In granivorous birds its muscular parietes are very thick and strong, and it is lined inside by a kind of thick, hard epidermis which resembles horn; in diurnal birds of prey, on the contrary, it is very thin, and in some aquatic birds, such as Herons and Pelicans, it forms but a single sack with the second stomach.

31. The *intestines* of birds are not so long, generally, as those of the mammalia; in most of these animals they are only two or three times the length of the body. The intestinal canal is divided into two portions, namely, the small and the large intestine, and near the anus, it has two appendices, terminating in cul-de-sacs, called cœcums.

32. The *small intestine* communicates with the gizzard by the opening of the pylorus, which is situate very near the cardia, and is without valves. The bile is poured into this intestine by two ducts, which alternate with two or three canals, through which passes the pancreatic juice.

33. The secreting organ of the bile, the *liver*, is generally more voluminous than in mammals, and is divided into two nearly equal lobes. The *gall-bladder* is ordinarily large, but in some birds, such as the Parrot, it is entirely wanting.

34. The *pancreas* are also large, and are found in the first fold formed by the intestine.

35. The *cœcums* vary much in length; in the granivorous, and omnivorous birds, they are generally thick and long; they are wanting in most of the diurnal birds of prey, but in the nocturnal birds of prey, they are, on the contrary, very large.

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30. What constitutes the second stomach or ventricle in birds? What is the gizzard? Are the gizzards of all birds alike?

31. What is the length of the intestinal canal in birds? How is it divided?

32. How does the bile enter the small intestine?

33. Is the gall bladder found in all birds?

34. Where are the pancreas situated?

35. Are the cœcums generally of the same size? Are they always present in birds?

36. The *large intestine* is very short, and terminates by a dilatation called *cloaca*, which receives the urine as well as the eggs.

37. The chyle, derived from the digestion of food, is absorbed by the chyliferous vessels, which unite with the lymphatic vessels of the extremities to form two *thoracic ducts*, which mount in front of the vertebral column, and empty into the jugular veins, near the heart.

38. The blood of birds does not contain circular globules like that of mammals, but oval globules like those contained in the blood of reptiles and fishes. These solid particles are more abundant in birds than in other vertebrate animals, and the temperature of this liquid is higher than in the mammalia, which are nevertheless, warm blooded animals.

39. The circulation is carried on in the same manner as in the mammalia; it is double and complete, that is, before reaching the point from which it departed, the blood passes through two systems of capillary vessels, and all the venous blood is changed into arterial blood.

40. The heart has four cavities, namely: one ventricle and one auricle placed on the left, and the same on the right side. The blood is forced by the left ventricle into the aorta, which distributes it to the capillary vessels of all parts of the body. This liquid then returns to the heart through the veins, and enters the right auricle, which forces it into the right ventricle which is situate beneath it; this last cavity, by contracting, sends the blood to the lungs, through the pulmonary artery; from the pulmonary artery the blood passes into the capillary vessels of the lungs, where it is changed into arterial blood; then it enters the pulmonary veins, and passing through them, reaches the left auricle; finally, the left auricle pours it into the left ventricle, whence we have just seen it go forth to be distributed to all the organs.

41. Birds are distinguished from all other vertebrate animals by their mode of *respiration*, which is aërial, as it is in the mammalia and reptiles; and it takes place not only in the lungs, but also in the substance of all the other organs. In the mammalia

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36. What is the cloaca?

37. What becomes of the chyle formed by the process of digestion?

38. What is remarkable about the globules in the blood of birds?

39. What is the character of the circulation in birds?

40. What route is taken by the blood in completing its circuit through the body?

41. What are the peculiarities of respiration in birds? In what respect do the lungs of birds differ from the same organs in mammals?

and in reptiles, the bronchiæ terminate in little cells, which all end in a cul-de-sac, and the air that enters the lungs cannot pass beyond them, while in birds, the bronchiæ and pulmonary cells communicate with the great cavities, and this fluid, in this manner, penetrates to all parts of the body, even into the interior of the bones and feathers. (*Plate* 2, *fig.* 1.) These cavities, by means of which the air is distributed to the different parts of the body, are formed of very thin laminæ of cellular tissue, and are designated under the name of *aerial pouches.*

42. Consequently, the blood comes in contact with the air in passing through the capillary vessels of all the organs, as well as in passing through the capillary vessels of the lungs, and we might say that the *respiration of these animals*, as well as their circulation, *is double.* A bird consumes, proportionably, more air than any other animal, and perishes more rapidly when its respiration is interrupted.

43. The cavity of the thorax, which contains the heart and lungs, is not separated from the abdomen by a complete muscular partition, as in the mammalia; the diaphragm is rudimentary, and only occupies the sides of the body; but the lungs are adherent to the ribs, so that they are forced to dilate when these bones separate from each other; therefore, the movements of inspiration and expiration are performed nearly in the same manner as in the mammalia.

LESSON II.

Eggs.—Incubation.—Nests.—Migration.—Classification.

Habits of Birds.

1. Birds, like reptiles, fishes, and most of the invertebrate animals, (that is, without vertebræ,) are *oviparous*, that is, they lay eggs from which their young are hatched.

2. The *Egg* is first formed in an organ, named *ovary*, and descends (*Plate* 2. *fig.* 4.) from it, through a long tube called *oviduct;* it consists at first of a membranous sack filled with yellow matter, and is not surrounded with the white till it reaches the oviduct, where it receives a more solid envelope which becomes encrusted with a calcareous matter that constitutes the

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42. What are the consequences of the peculiarity of the respiratory apparatus?
43. What is the character of the diaphragm in birds?

1. Why are birds said to be oviparous?
2. How are eggs formed?

shell. Upon the membrane of the yolk, or yellow matter, we perceive a whitish point, which, in the course of its developement, becomes the young animal, for the nourishment or protection of which, all the other parts of the egg are destined.

3. In order that the young bird may be developed in the interior of the egg, it must be maintained at a certain degree of heat; in very warm countries, the heat of the sun is sometimes sufficient to bring about this phenomenon, and there, certain birds abandon their eggs; but in most cases it is altogether different, and both parents or the mother alone, maintain the necessary heat by sitting on them.

4. The duration of *incubation*, (or the time required by the young bird to become developed in the interior of the egg) varies in different species, but it is the same in all birds of the same species; it is from forty to forty-five days for Swans, twenty-five days for Ducks, twenty-one days for Hens, from twelve to fifteen days for domesticated Canary birds, and only twelve days for the Humming-bird.

5. Almost all birds construct a *nest*, to receive their eggs and to serve as a dwelling for their young, which, during the early period of life, are unprovided with feathers, extremely delicate, and incapable of moving, and of feeding themselves. Generally there is displayed in these structures an art, an adroitness, and an elegance which excite our admiration; and one thing not less surprising is the regularity with which all the successive generations perform the same tasks, and build nests exactly alike, even under circumstances which prevent these animals from seeing and taking lessons from their parents; a wonderful instinct guides them, and induces them to take many precautions, all the utility of which they cannot anticipate, or appreciate before hand.

6. The form, arrangement, and placing of the nest, vary for almost every species of bird. That which is constructed by the largest birds of prey rests upon a flat surface afforded by some part of a rock, or on the platform of some tall tower; its extent is very considerable, and every year contributes to its increase, for it is rare for these birds to abandon their first monument of maternal tenderness; those that leave it, return periodically to lay their eggs. This nest is frequently composed of such stout

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3. What circumstance is necessary to the developement of the egg?

4. Is the same period of time required by all birds for incubation?

5. What means are provided for the reception of the eggs, and of the young birds which escape from them?

6. Are the nests of all birds alike in their structure? What is the structure of the nests of birds of prey?

pieces of wood, that one would scarcely believe they could be carried by a bird, if he were not aware of the extraordinary strength of their muscles; they are so arranged as not to yield readily to the force of the wind, and they support boughs which are bound to each other by the remains of food and of excrement, forming a solid habitation bearing the name of *eyry.* Those species that, in the construction of their nests, only employ rushes and reeds, accumulate them in such quantities, and fix them so firmly to the platform that rains or storms seldom cause their destruction.

7. Most birds build their nests in the bifurcation of the branches of trees; in this case, bits of straw and small pieces of wood, carried in the beak, tied and interlaced by means of this organ, and the aid of the foot, constitute the external frame, which supports the moss and down that form the bed. Some species have the habit of suspending their nest, which is wrought in a still more artist-like manner, to the extremity of a flexible twig, so that, in obedience to every impulse of the winds, this cradle and the sitting bird that inhabits it, experience an almost continued rocking.

8. Certain nests present, in their structure, a perfect masonry made of little sticks, gravel, or small leaves impregnated with mortar, formed of earth softened with the salivary humor of the bird, or simply mixed with it. How much toil and how frequent must be the goings and comings for the completion of this work! And, when we remember that the bird has, for the execution of its task, but a single instrument, which also serves for the transportation of the materials, we cannot withhold the admiration which is so justly merited. The form of these mortar-built nests, is ordinarily either spherical, conical, or elliptical; they are established in the angles of windows, of chimnies, of walls, and often on the tables of sheltered rocks. They are either isolated or placed one against the other; the entrance is made either on the top, or in one side, and sometimes in the lower part. Frequently we find in these structures several compartments; sometimes a sort of vestibule is separated from the true nest, by a partition, and it is into this apartment that the male retires, after he has carried the necessary food to his sitting female companion.

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7. What is the situation usually selected by the majority of birds for building their nests?

8. What instruments are used by birds in the construction of their nests? What is the form of those nests that are put together, like mason work, with a species of mortar? Do nests ever contain more than one apartment?

9. There are also birds that build their nests upon the ground, and in order to guard against their being submerged by heavy rains, elevate them on hillocks of earth: these nests are constructed with less care: we here find only an abundance of down, sustained by flexible twigs, suitably interlaced; finally, some birds are content to form an excavation in the earth or sand, in which they deposite their eggs, which for the most part they assiduously sit upon, but which they sometimes abandon during the day to the heat of the sun; nevertheless, in this latter case, their solicitude induces them to cover their eggs with a light layer of sand or other matter, either to hide them from animals that seek them for food, or to protect them from the too great intensity of the sun's rays.

10. The constancy of birds in sitting on their eggs is admirable: sometimes both parents divide this care between them; at other times the male only watches the nest and brings food to the female, while she remains sitting on the eggs; and in other species again, the female alone is charged with the incubation. Generally, the mother only leaves her nest for a few moments when pressed by hunger, and then seemingly with regret; and, in most cases, after her young have appeared, she bestows upon them, and for a long time after their birth, the most tender care and attention. She covers them with her wings to protect them from the cold, brings them choice food, which she often half digests, and then disgorges into their throat, to render it better suited to their tender stomach; she guides their first steps, teaches them to use their wings, and when threatened by danger, displays as much courage as devotion in their protection.

11. In this particular, it is very interesting to study the habits of birds; but this is not the most remarkable point in their history. The most singular phenomenon in the lives of birds, is unquestionably the habit, which certain species have, of making, at appointed periods of the year, long journeys, and changing their climate according to the seasons.

12. Birds that feed on insects, early leave temperate climates to go towards the south, where they find in the winter a more abundant supply of food; other birds change their country to seek a place more propitious for their young, and go sometimes

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9. Do birds always build their nests in elevated situations?

10. Does the male bird ever assist in the process of incubation? In what way? Are the young birds able to feed themselves when they first escape from the shell?

11. What is the most remarkable circumstance in the general history of birds?

12. What are the reasons which induce many birds to migrate?

to the north and sometimes to the south to lay their eggs; in others again this migration is not determined by any appreciable cause.

13. Some migratory birds perform their journeys through the air alone or only accompanied by their females; but the number is small comparatively to those that travel in company. We admire in the latter the instinct which induces them to assemble at a certain place, ten or twelve days previous to the time of departure, which is ordinarily an indication of a change of weather; for it is remarked that birds feel the influences sufficiently early to derive prognostics of the change of temperature from their deportment and certain habits. During the whole journey, the most perfect order prevails throughout the whole troop; to be convinced of this fact we have only to observe the flight of some large species, such as geese. The conducting of the troop is confided to a chief placed at the head of two files, more or less separated from each other, which meet at a point; the chief is the summit or point of this moving angle, and opposes the first resistance of the air, clears the way, and the whole band follows him, observing the most perfect order. As the efforts of the chief are very violent, and as he cannot support them during the whole voyage, he is perceived, when overcome by fatigue, to yield his post to his next neighbour, and fall into the ranks at the extremity of one or other of the files. The period of these great migrations is fixed by nature for each species of migratory birds, and it is remarked, they follow the same route every year: hence, in certain districts, the fowlers or bird-catchers, count upon their passage as upon a revenue of rent that falls due every quarter, and calculate in advance the period, and the chances. Armed with their nets and all the apparatus of the chase, they station themselves in the gorges and valleys over which the flocks pass, and reach their several points a few minutes before their arrival. These bands or flocks are sometimes so numerous, and the individuals composing them are so close together that they might be readily mistaken for dense clouds.

14. Certain birds always lead an erratic life, and seem to have no country: these are the most powerful on the wing; many seem not to be impeded by the strongest wind, and appear to delight in the midst of storms. They form a striking contrast with a small number of species, less favoured by nature, which,

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13. How are these migrations formed? At what period do these migrations take place? Are these periods very certain?

14. Do all birds belong to some one or other country? Are all birds active in flight?

deprived of the organs of flight, and possessing a slow and embarrassed gait, are condemned never to leave the rock on which they were born. These birds exercise their patience in awaiting for prey that is brought to them by the rolling in of the waves; and it is only when it escapes them, and they become hard pressed, that they venture into shallow depths in pursuit of it.

15. Birds also differ very much from each other in their diet or food; some seek living prey only, and feed exclusively on the produce of their hunting or fishing; sometimes they catch other birds of prey and force them to disgorge the food which they were about to eat. There are others which, with appetites not less carneous, but wanting in the strong arms and courage of the first, only prey upon dead bodies. Others live exclusively on worms or insects, and others again, eat nothing but grains.

Of the Classification of Birds.

16. Birds differ much less from each other than the different mammals; except some modification in the plumage, in the general form of the body, in the disposition of the beak, and in the conformation of the feet, they resemble each other very much; hence, it is very difficult to subdivide the class which they form.

17. The number of species of birds known by naturalists is about five thousand. Their classification, like that of mammals, is founded chiefly upon the modifications that are remarked in the organs of mastication and prehension, or of locomotion, that is, the beak and feet.

18. According to these characters they are divided into six ORDERS, namely; Rapaces, or Birds of Prey; Passerinæ, or Migratory Birds; Scansoriæ, or Climbing Birds; Gallinaceæ; Grallatoriæ, or Waders; and Palmipedes, or Swimming Birds.

19. The principal characters by which these groups are distinguished from each other may be seen in the following table.

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15. Upon what substances do birds feed?

16. What renders it difficult to sub-divide the class of birds into genera, &c.?

17. Upon what is the classification of birds founded?

18. Into how many orders is the class of birds divided? What are the names of these orders?

19. (*Answered by the table.*) What orders compose the division of terrestrial birds? What are the distinguishing characters of the Accipitres or Rapaces? What are the distinguishing marks of the Passerinæ? By what means are the Scansoriæ distinguished from the Passerinæ? What are the distinguishing characters of the Gallinaceæ? What orders compose the division of Aquatic birds? How are the Grallatoriæ distinguished? How are the Palmipedes recognised?

					(Orders.)
BIRDS.	*Terrestrial*, the feet of which are not formed either for swimming or wading, having	Talons very strong, armed with pointed, hooked nails; beak hooked and sharp.			Rapaces, or Accipitres.
		Toes feeble, and not armed with sharp hooked nails.	Beak generally pointed, and not vaulted above; wings generally long, and body erect.	A single toe, directed backwards, and three forwards.	Passerinæ.
				Two toes directed backwards, and two forwards.	Scansoriæ.
			Superior mandible arched or vaulted; nares partly covered by a soft, inflated scale; gait heavy; wings short.		Gallinaceæ.
	Aquatic, the feet of which are formed for	Wading, the tarsus being very long, and lower part of the leg naked.			Grallatoriæ.
		Swimming, the toes being palmate, and the legs short, and placed far back on the body.			Palmipedes.

LESSON III.

ORDER OF RAPACES, (*or Accipitres.*)—*Zoological Characters.—Habits.—Division into two Families.*

FAMILY OF DIURNÆ.—*Zoological Characters and Habits of Vultures,* (*Yellow Vulture, King of the Vultures, Condor, Percnopterus of Egypt.*)—*Griffins.—Tribe of Falcons—Division into two groupes, noble and ignoble.—Falconry,* (*Common Falcon*)—*Eagles.—Fisher-Eagles.—Sparrow-Hawks.—Kites—Buzzards.—Harriers.—Characters and Habits.*

FAMILY OF NOCTURNÆ.—*Characters and Habits.*—(*Owl.—Strix.—Duc.*)

ORDER OF RAPACES, OR ACCIPITRES.

(*Birds of Prey.*)

1. Birds of Prey are recognised by their *beak, being hooked and terminated by a point which is sharp and bent downwards, and by their feet being very strong and armed with powerful, hooked nails.* (*Plate* 3, *fig.* 1, *to* 8.)

2. They are generally remarkable for their strength; the muscles of their thighs and legs are very voluminous and give great power to their talons; their tarsi are rarely elongated: all of them have four toes, the first of which, or thumb, is directed backwards; the nails of this toe, and of the internal toe are the strongest, and there is often a very small palmate membrane betwixt the bases of the external toes. Their wings are large, and the sternum, which affords place for the attachment of the principal muscles of flight, is generally very much developed and without lateral notches.

3. It is also to be remarked that their nares are pierced through a membrane, called *Cera,* that covers the whole base of the beak.

4. All the Rapaces live exclusively on flesh; they pursue other birds and even small quadrupeds and reptiles: they are also very powerful in flight.

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1. How are the birds of prey characterised?

2. What are the characters of the legs of birds of prey? What is the number of their toes? What is their direction? What is the character of the sternum?

3. What is meant by the *cera?*

4. On what do the Rapaces feed?

5. Like the Passerinæ and Scansoriæ, birds of prey are born generally naked, with the eyes closed, and cannot live without the assistance of their parents, who, during their tender age, supply all their wants.

6. These birds form two families: the *Diurnæ*, and the *Nocturnæ*, which may be distinguished by means of the following characters:

RAPACES.	*Diurnæ.*	*Eyes* directed from the side; the *head* and *neck* well proportioned; the *external toe* directed forward, and almost always united to the middle toe by a small membrane.
	Nocturnæ.	*Eyes* directed forward; *head* very large and *neck* very short; *external toe* may be directed either forwards or backwards.

FAMILY OF DAY BIRDS OF PREY, OR DIURNÆ.

7. The Diurnæ have their eyes directed sidewise; the head and neck are well proportioned; (*Plate* 3, *fig*. 1. *&c.*) the nares are pierced through a naked membrane, called *cera*, which covers the base of the beak; they have three toes in front and one behind without feathers, and the two external ones are almost always united at their base by a short membrane; flight powerful; the quills strong; the plumage close; the sternum large and completely ossified, and the fourchette semi-circular, and widely separated; finally, the stomach is almost entirely membranous, and the intestines of small extent.

8. The family of Diurnæ is divided into three principal tribes, easily recognised by the following characters:

			(Tribes.)
DIURNAL RAPACES, having	Eyes even with the head, and talons proportionally feeble.	A more or less considerable part of the head and neck destitute of feathers.	**VULTURES.**
		Head covered with feathers.	**GRIFFINS.**
	Eyes surmounted by a projecting eyebrow which makes them appear sunk in the head; talons very strong.		**FALCONS.**

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5. What is the condition of birds of prey at the time of birth?

6. Into what families is the order of Rapaces divided? How are the Diurnæ characterised? In what respects do the Nocturnæ differ from the Diurnæ?

7. How are the Diurnæ distinguished? On finding a membranous stomach and intestines of small extent in a bird, upon what would you infer that it habitually fed?

8. Into what tribes is the family of Diurnæ divided? What are the characters of Vultures? How do Griffins differ from Vultures? What are the characters of Falcons?

Tribe of Vultures.

9. The Vultures,—*Vultur,*—are recognised by the nakedness of a portion of the head or even of the neck, and by the form of their beak which is elongated and curved only at the end. (*Plate* 3, *fig.* 4, *and* 6.)

10. These birds have a disagreeable aspect, a tainted odour, and their habits excite disgust; they are cowardly, and feed on the most putrid carrion rather than on living prey. The power of their talons does not correspond to their size, and they make use of their beak rather than of their claws. They are extremely voracious: but after they have been complely satiated, it seems, they can wait several weeks for an opportunity of feeding again. After they have eaten, their crop forms a large projection above the fourchette; they become dull and stupid, and a sanguineous, fœtid humor flows from the nose. The sense of smell in these animals is very fine, and enables them to perceive at incredible distances, the remains of dead bodies, which they seek for food.

11. In Peru, Egypt, and some countries of the East, they are very useful to man, for they serve to cleanse the streets of animal remains that it is customary to throw there, and they may be seen promenading many towns, in small bands, and watching even in the houses for recent or putrid dead bodies.

12. Vultures live, generally, in pairs; they prefer building their nests on inaccessible rocks, and construct them of pieces of wood, joined together by a sort of mortar: the young are covered with down when born, and are fed on half digested food, which is disgorged by their parents before them.

13. Their wings are so long, that when they walk, they keep them half extended, and they often experience difficulty in taking to flight after alighting on the ground; their ascent is slow but well sustained, and is always effected obliquely and by constantly turning about.

14. The tribe of Vultures is divided into four genera, namely: the Vultures properly so called, the Sarcoramphus, the Cathartes, and the Percnopterus, which are distinguished in the following manner:

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9. How are Vultures recognised?
10. What is the general character of Vultures?
11. In what way do Vultures make themselves useful to man?
12. What is the condition of Vultures when first born? Upon what do they feed?
13. Do Vultures rise into the air readily from the ground?
14. How is the tribe of Vultures divided? How is the Sarcoramphus distinguished from the Vulture properly so called? In what respect does the Cathartes differ from those two genera? How does the Percnopterus differ from the Cathartes?

				(Genera.)
Vultures, having the neck	Divested of feathers, as well as the the head; the nares	Transverse; and the head	Without caruncles.	Vulture properly so called.
			With caruncles.	Sarcoramphus.
		Longitudinal,		Cathartes.
	Almost entirely feathered,			Percnopterus.

15. Vultures properly so called, are distinguished by their naked head and neck, by the ruff or collar of feathers that surrounds the base of the neck, by their stout, strong beak, and by the disposition of their nares. (*Plate* 3, *fig*. 6.) They have no fleshy excrescences on the head, and they belong exclusively to the old continent.

16. The most widely diffused species, is the *Yellow or Fulvous Vulture*,—*Vultur fulvus*,—which equals, and even surpasses the Swan in size; it is found on all the mountains of the eastern continent.

17. The Sarcoramphus differs from the Vulture properly so called in the fleshy caruncles which grow above the base of the beak; it inhabits the western continent. [The genus consists of two species.]

18. The *King of the Vultures*,—*Vultur papa*,—is a species of Sarcoramphus of the size of the goose, which inhabits the warm parts of South America; it derives its name from the fear with which it inspires another species of Vulture of the same country, (the Percnopterus Urubu) which abandons its prey and always gives place to him.

19. To this group also belongs the *Condor*, or great *Vulture of the Andes*,—*Vultur gryphus*,—so famous, through exaggerated accounts, for its size and strength. It is not much more than four feet long, but its spread wings often measure more than ten feet; it flies higher in the air than any other bird; it inhabits the most elevated of the Cordilleras of the Andes, and never descends to the plain except when pressed by hunger. [Condors are frequently seen, on the shores of Chile and Peru, feeding on the carcasses of whales that have been accidentally thrown upon the beach, or left by whalemen.]

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15. What are the generic characters of Vultures properly so called?

16. What species of Vulture is most common? Where is it found?

17. Where is the Sarcoramphus found?

18. From what circumstance does the King of the Vultures derive its name?

19. What is the size of the Condor? Where is it met with? What are its habits? For what is it most remarkable?

"Just before turning off from the beach, we came to the recent carcass of a mule, upon which seven large Condors and a crowd of buzzards were feasting. They allowed us to approach so near that, had we been provided with arms, we might have shot them as they arose slowly on the wing. These birds frequently destroy small animals. They sometimes form a circle around a sheep, or a goat; and, spreading out their wings approach till they strike their prey, and then falling upon it, devour the body, even to the bones. In the country they are caught in the following manner. A pen is formed of high palisadoes driven into the ground, and a fresh carcass placed in the centre. It is left alone. In a short time, the Condors, who scent their food for many miles, descend into it, and while feasting, the peones, (labouring men in Chile are so called) armed with clubs, and the body and limbs well protected with hide, enter the enclosure and commence the work of destruction. These birds cannot rise without running thirty or forty yards, which the limits of the pen will not allow, and they are clubbed to death, not however, without making resistance, and occasionally inflicting very severe wounds on their pursuers."—*Three Years in the Pacific.*

20. The Cathartes, which have no caruncles on the head; and whose nares are longitudinal and oval, are also found in America; there is one species (*Cathartes Vulturinus*, also called *Vultur Californianus*,) which approaches to the Condor in size, and has wings, even longer, in proportion. The tarsi are partially covered by the feathers of the legs. It inhabits California.

[The *Turkey Buzzard*, or *Gallinaza*,—*Vultur aura*,—*Cathartes aura*,—is of a bluish black colour, and as large as a cock. It is common in warm parts of the United States, and is occasionally seen as far north as New Jersey. It feeds upon carrion and filth, but never attacks living animals, except when helpless and unable to defend themselves. This bird is very common in Peruvian towns, where it acts the part of scavenger, and is for this reason protected by law.]

21. The Percnopteri, (*Plate* 3, *fig*. 4.) which are distinguished from all the preceding by their feathered neck and long, slender beak, are of moderate size, and do not possess nearly so much strength as the other Vultures; but they attack with greater avidity carrion and all sorts of filth which attract them from a distance; and they do not disdain excrement itself.

22. The *Percnopterus of Egypt*, (*Pharaoh's Bird*,)—*Vultur percnopterus*, or *Vultur leucocephalus*, or *Vultur fuscus*,—is of

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20. What are the Cathartes? Where are they found?

21. How are the Percnopteri distinguished? What are their habits?

22. What is Pharaoh's bird? Where is it found? What are its habits?

the size of a crow: it is very common in the warm countries of the eastern continent, and follows the caravans through the desert to devour all that die. The ancient Egyptians respected it on account of the services it rendered the country by removing dead bodies: it is often seen represented on their monuments. Even at the present day no injury is offered to it, and there are even devout mussulmans who bequeath wherewith to support a certain number.

23. In America there is another species of Percnopterus, the *Urubu,*—*Vultur jota,*—which performs the same services there.

Tribe of Griffins.

24. These birds,—*Gypaetos,*—(*Plate* 3, *fig.* 3.) have the head and neck almost entirely covered with feathers; the beak is strong, straight, hooked at the end, and inflated on the curve: the nostrils are covered by stiff bristles; there is a pencil of bristles under the beak; the tarsi are short and feathered to the toes.

25. In their conformation and habits, they very closely resemble the Vultures. Their talons are proportionally weak, and their wings are long and partly separate when in repose. When the crop is full it projects at the lower part of the neck.

26. The *Lamb Vulture,*—*Vultur barbarus.*—*Falco barbatus,*—(The Læmmer-geyer)—which the Greeks named *Phene,* and the Latins called *Ossifraga,* is the largest of the birds of prey of the eastern continent, the high mountain chains of which it inhabits: it is almost as large as the Condor, and attacks lambs, goats, chamois, and, it is said, even sleeping men. Generally it endeavours to force animals to throw themselves from precipitous rocks, and devours them after they have been killed by the fall. His mantle is black with a white line in the middle of each feather, and all beneath the body as well as the neck is of a clear, brilliant, yellow colour.

Tribe of Falcons.

27. The Diurnal Rapaces composing this tribe have the head and neck covered with feathers, like the preceding, but are distinguished from them by their projecting eye-brows which make

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23. What is the Urubu?
24. How are the Griffins distinguished?
25. In what particulars do Griffins resemble Vultures?
26. What is the Lamb Vulture? Where is it found? What are its habits?
27. How is the tribe of Falcons distinguished from other tribes of Diurnal Rapaces?

the eyes appear as if they were sunk into the head, and give to the physiognomy of these animals an aspect altogether different from that of the Vultures and Griffins. (*Plate* 3, *fig* 1, 7, *and* 8.)

28. These birds have a lofty, rapid, and sustained flight; their sense of sight, which is more extended and clearer than in any other animal, enables them to perceive the smallest prey, when they themselves are so high as to be out of the reach of our vision.

29. Most of them feed willingly on flesh while it is yet palpitating; but when pressed by hunger, they do not refuse dead bodies, as it has been generally believed, and instead of eating their prey on the spot as the vultures do, they bear it off to their eyry; the largest species attack mammals and birds, others live on fishes, some feed on reptiles, and others are exclusively insectivorous. The female is generally a third larger than the male, and for this reason, is often designated under the name of *tarsel.* Moulting takes place but once a year, and age induces such great change in the plumage of these birds, that naturalists have frequently mistaken varieties depending on this cause alone, for distinct species; the young are generally variegated with spots and longitudinal stripes, while the old ones are more uniform in colour, and are rather striped transversely; they are not clothed in their last or permanent livery until their third, fourth, or even sixth year, and then the colours of their plumage differ according to the sex.

30. They all seize their prey with their talons; some, (such as the Falcon, the Kite, &c.) precipitate themselves perpendicularly upon the animals they wish to possess; others, (the Buzzard and Goshawks, for example) approach obliquely and attack sidewise only. They are, generally, silent and very difficult to tame, although some of them can be trained to hunt on the wing.

31. This tribe, which embraces a great number of species, is divided into two principal sections, namely: *Noble* birds of Prey, and *Ignoble* birds of Prey, so named, because the former are employed in falconry, and the latter are not; and each one of these sections is sub-divided in its turn, as may be seen in the following table:

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28. How does the vision of Falcons compare with that of other animals?

29. Upon what do the Falcons feed?

30. How do they lay hold of their prey? Are Falcons noisy birds? Are they easily tamed?

31. How is the tribe of Falcons divided? What genera form the Noble Birds of Prey? What is the chief distinguishing feature of the Noble birds of Prey? What genera belong to the Ignoble birds of Prey?

							(Genera.)
Diurnal Birds of Prey of the tribe of Falcons, having the wings	Pointed.	*Noble Birds of Prey.*	The superior mandible armed with a notching near its point.				FALCONS Properly so called.
			The upper mandible having only a scallop near its point.				GERFALCONS.
	Truncate at the end.	*Ignoble Birds of Prey.*	Beak very strong, straight at the base, and curved only towards the point.				EAGLES.
			Beak curved from its base.	Strong; wings moderate - - - -			GOSHAWKS.
				Feeble; wings long.	Tail forked - - - - -		KITES.
					Tail equal.	Feathers between the eye and beak.	HONEY-BUZZARDS.
						A naked space between the eye and beak.	BUZZARDS and HARRIERS.

32. In the DIVISION OF NOBLE BIRDS OF PREY, the second quill of the wing is the longest, and only exceeds the first one a very little, which makes their wings pointed, and influences their manner of flight very much; when the air is calm, their flight is always very oblique, and to rise perpendicularly they have to fly against the wind.

33. FALCONS PROPERLY SO CALLED—*Falco*,—are recognised by the tooth or notching with which the upper mandible is armed on each side, near its point, and by their wings being almost always as long or longer than their tail. In proportion to their size they are the most courageous of all birds of prey; a quality which corresponds with the power of their arms and the strength of their wings. They are also the most docile of the hunting birds, and the most important in the art of falconry, as they are taught to pursue the game, and return when they are called.

34. The principal species of this genus are; the *Common Falcon*,—*Falco communis*,—which is of the size of a hen, and inhabits all the northern part of the globe; the *Hobby*,—*Falco subbuteo*,—the *Merlin*,—*Falco æscalon*, and the *Falco lithofalco*,—which inhabit Europe, and when young resemble the common Falcon; the Kestrels, have shorter toes and their flight is not so rapid. The duration of the life of the Falcon is very great; it is stated that in the year 1793, a person caught, at the Cape of Good Hope, a falcon wearing à collar of gold, upon which was engraved, this bird, in 1610, belonged to James I, King of England. It was consequently, upwards of one hundred and eighty years old, and still preserved its vigour. The flight of the falcon is very rapid; it commonly feeds on large birds, such as pheasants, pigeons, dücks, geese, &c., and to possess them, it rises above its prey, and pounces perpendicularly upon it. This quality and the facility with which the common faloon may be trained, caused it to be much esteemed when the great and wealthy were pleased to pursue game with birds, as they do now with dogs; this bird has given its name to the art of hunting with birds of prey. The manner of training these animals was by shutting them up from the light, exhausting their strength by fatigue, and fasting, and then presenting bait, and accustoming them by degrees to pursue this or that kind of game.

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32. Which is the longest quill in noble birds of Prey?

33. What is the distinguishing mark of Falcons properly so called? What is their general character?

34. What are the principal species of Falcon? What is falconry?

35. The *Gerfalcons,—Hierofalco,*—have the tail much longer than the wings, which are also large. Only one species is known.

36. The *Gerfalcon*, or *Iceland Falcon,—Falco candicans*, and *Falco islandicus*,—is most esteemed of all birds in falconry. It is a fourth larger than the Falcon, and chiefly inhabits the northern parts of Europe.

37. In the DIVISION OF IGNOBLE BIRDS OF PREY, the beak has no lateral tooth near its point, but a simple scallop or festoon, and the fourth quill of the wing is almost always the longest, while the first is very short; in consequence of this the wings are truncate at the extremity, and their flight is more feeble. They have been called ignoble because they could never be employed in falconry.

38 This section is very numerous, and is divided, as we have already seen, into many genera, which are sub-divided again into sub-genera, many of which are sufficiently important to be noticed in this place.

39. The genus of EAGLES,—*Aquila*,—comprises the strongest and most courageous birds of prey of the great tribe of Falcons, and is distinguished by the form of the beak; it is sub-divided into Eagles properly so called, Fisher-Eagles, Ospreys, Harpies, &c.

40. EAGLES PROPERLY SO CALLED,—*Aquila*,—have the tarsi feathered to the roots of the toes, and the wings as long as the tail. (*Plate* 3, *fig* 1.) [Their vision is wonderfully extensive, and they are enabled to fix their eyes upon the sun, by the aid of the *membrana nictitans*, which lessens the intensity of the light.]

41. These birds are remarkable for the nobleness of their bearing, and for their bold and daring attitude. They are celebrated for their courage, and as their habits are always in correspondence with their organization, nature has endowed them with great strength and powerful arms. They are fond of carnage, and in general they prefer attacking animals of considerable size: it is only when they are pressed by hunger that they pursue small birds, and they never eat carrion, even when in a state of absolute want. They generally live in pairs, but

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35. How are the Gerfalcons distinguished?

36. How many species of Gerfalcons are known?

37. How are the ignoble birds of prey distinguished? Why are they called ignoble?

38. Are the divisions of this section numerous?

39. How is the genus of Eagles distinguished? What are the sub-genera?

40. How are Eagles properly so called distinguished?

41. What are the habits of Eagles? Do they eat carrion?

do not permit, other birds of prey to reside in the vicinity of their abode; they do not even permit their young to share the domain wherein they are established, and drive them off as soon as they are able to provide for themselves. The male and female are generally seen at a short distance from each other, and they seem to have a sort of understanding with each other in hunting; it is asserted, that one of the two beats the bushes while the other awaits on some rock or neighbouring tree, to seize the startled game in its flight. While the female is detained in the eyry by the incubation of her eggs, or by the cares required by her young the male hunts alone, and, as it is the season when game begins to abound, he easily provides for his own subsistance as well as for that of his companion. These animals can endure very long fasting, especially when captivity or maternal cares force them to repose. A common eagle taken in a snare, has been known to pass five weeks without taking any aliment, and not appear enfeebled, except during the last eight days. The capacity of their crop is very considerable, and this pouch may serve as a reservoir of food sufficient for several days.

42. Eagles properly so called, are found in all parts of the eastern continent, and some species belong to New Holland. In general, they inhabit the main land, and do not establish themselves either on narrow peninsulas or on islands, unless they are of great extent. They live on mountains and ordinarily construct their nests or *eyries* on the highest and most precipitous rocks, or on the platform of some deserted tower. These nests are of considerable extent, and rest most frequently on some flat surface found amongst the rocks; they are built of pieces of wood, which are often five or six feet in length; their interior is lined with moss and dry leaves; and their height increases every year by the accumulation of the bones of animals which these birds bring to their nests. In short, eagles never change their eyry; the one they build for their first laying of eggs serves them for the remainder of their lives.

43. In the genus of Eagles, as well as in all other birds of prey, the female is much larger than the male, and seems to be also the most courageous. She lays but two or three eggs every year, and frequently rears only a single eagle at a time. The duration of incubation, (at least for the imperial eagle,) is thirty days.

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42. Where are Eagles found? What situations do they select for their nests?

43. How does the female differ from the male Eagles? How many eggs does she lay in a year?

44. The *Common Eagle,—Falco fulvus,—Falco melanaetos,—Falco niger,* (*Plate* 3, *fig.* 1.) which is also called, yellow eagle, or black eagle, and which has been distinguished by the name of Royal Eagle, from which it differs only in age, inhabits all the great forests of Europe, and is more particularly met with in the mountains of Sweden, Scotland, and the Tyrol; it feeds upon lambs and fawns, which it carries off with surprising force, and rarely attacks large birds. Its eggs are of a dirty white colour, spotted red.

45. The *Imperial Eagle,—Falco imperialis,—Aquila heliaca,*—has a shorter body, and longer wings than the common eagle; it inhabits the high, wooded mountains of the south and east of Europe, and is quite common in Egypt. It pursues deers, roebucks and other quadrupeds, from which it tears enormous shreds and carries to its eyry; it is still more terrible to other birds, and to it are to be attributed most of the exaggerated accounts of the strength, courage, and magnanimity, which the ancients gave of the Golden Eagle.

46. The FISHER EAGLES,—*Haliætus,*—differ from eagles properly so called in the tarsi, only the upper half of which are invested with feathers; they keep near the margins of rivers, and the sea, and live chiefly on fishes. The species which are designated by the names of *Ossifragus* and *Pygargus,* are found in all the northern parts of the globe.

47. The *Bald Eagle,—Falco leucocephalus,*—inhabits North America, and is constantly occupied in fishing. It is of a uniform deep brown colour, with a white head and tail; its beak is yellow and it is almost as large as the common eagle of Europe. It is the figure of this bird that is represented in the national emblems of the United States.

48. The *Ospreys,—Pandion,*—have the beak and feet of the Fisher Eagles. Only one species is known, which is found along the shores of fresh waters in almost every part of the globe. It is the Fish Hawk, or Osprey,—*Falco haliætus.*

49. The *Great Harpy of America,—Falco harpyia.*—Of all birds, this possesses the most terrific beak and claws; it is superior in size to the common eagle. Such are its powers that it is said to have cleft a man's skull with its beak; its ordinary food is the sloth, and it often carries off fawns.

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44. What are the characters of the common Eagle?
45. Where is the Imperial Eagle found? What are its habits?
46. What are Fisher-Eagles?
47. What is the Bald Eagle?
48. Where are the Ospreys found?
49. What is the character of the American Harpy?

50. The GENUS OF GOSHAWKS,—*Astur*,—comprises the *Goshawks* properly so called, and the Sparrow-hawks; they have the tarsi scutellated, (that is, armed in front with large scaly plates,) and are distinguished from each other by the length of this part of the claw. Although cowardly, they may be employed in falconry.

51. The SPARROW-HAWKS,—*Nisus*,—have the tarsi higher than the Goshawks; but the transitions from one division to the other are almost insensible.

52. The KITES,—*Milvus*,—have a forked tail and excessively long wings, which makes their flight exceedingly rapid; their tarsi are short and their nails weak; their beak (*Plate* 3. *fig.* 8.) is disproportioned to their size, and they are the most cowardly birds of this whole tribe. The *common kite* of France,—*Falco milvus*,—of all birds, sustains itself the longest and most tranquilly; the elegance of its flight has been celebrated by poets. It seldom attacks any thing but reptiles.

53. The BUZZARDS,—*Buteo*,—have very long wings, but their tail is equal, their feet are strong, and their beak is curved from its base. The only species found in France is the *Common Buzzard*,—*Falco buteo*. This bird dwells throughout the year in the forests, and appears stupid and idle; it often remains for several hours together perched upon the same tree; it does not seize its prey upon the wing, but awaits on a hillock of earth, a bush or a tree, from which it pounces upon its victim; it feeds on young hares, partridges, young birds, and, when this game fails, even on toads, serpents, grasshoppers, &c. The nest of the Buzzard is built of small branches and lined inside with wool or other soft substances; these birds lay two or three eggs, which are whitish, spotted yellow; the mother takes care of her young for a longer time than any other bird of prey, and it is stated, that the male continues to feed them after its female has been killed.

54. The HARRIERS.—*Circus*,—differ from the Buzzards in their more elevated tarsi, and by a sort of collar formed, on each side of the neck, by the ends of the feathers that cover their ears. There are three species in France, namely; the *Falco pygargus*, or bird of *Saint Martin*, which builds every where, and keeps very much in the fields; the *Falco cineraceus*, which has the

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50. What birds are comprised in the genus of Goshawks?
51. How are the Sparrowhawks distinguished from the Goshawks?
52. How are Kites characterised?
53. How are Buzzards distinguished? What are their habits?
54. How do Harriers differ from Buzzards?

same habits, and the *Falco æruginosus*, which keeps within the reach of water courses, and feeds on reptiles.

55. The Honey-Buzzards,—*Pernis*,—are distinguished from all the rest of the tribe of falcons by the feathers which cover the space between the eye and beak, which space in all other birds of this tribe is ordinarily naked, and simply furnished with a few hairs. The *Common Honey-Buzzard*,—*Falco apivorus*,—feeds on insects, and principally on bees and wasps.

56. Many naturalists also place in the tribe of Falcons, the Messenger or Secretary—*Serpentarius*, or *Gypogeranus*—a bird which inhabits the south of Africa, and which is very remarkable for the extraordinary length of its tarsi; but it differs too much from other birds of prey, to be arranged in the same tribe as the preceding, and should constitute by itself a fourth division of the family of Diurnæ.

57. The *Secretary*,—*Falco serpentarius*,—inhabits the dry and open grounds in the vicinity of the Cape of Good Hope, where it hunts reptiles on foot; its claws consequently become much worn. "I perceived one day," says M. Smith, "a *Secretary* that made two or three turns on the wing, near to where I was. He soon settled, and I saw that he examined very attentively some object near the place where he alighted. Having cautiously approached, he extended one wing which he constantly agitated. I then discovered a serpent of large size, elevating its head, and seemingly awaiting the advance of the bird to strike him; but a quick blow of the wing of the Secretary soon turned it over: the bird appeared to wait till the serpent should rise in order to strike again, but approached, and seizing it in his claws and beak, rose perpendicularly into the air, from whence he let it fall, and thus finished the killing, and afterwards disposed of it in perfect security."

FAMILY OF NOCTURNAL BIRDS OF PREY.

58. The birds of prey of the family of *nocturnæ*, have a very large head and a very short neck, (*Plate* 3, *fig*. 2. *and* 5.); the eyes are directed forward and surrounded by a circle of fringed feathers, the anterior of which cover the cere of the beak, and the posterior, the opening of the ear; the pupil is very large and the sight is weak. The external toe can be directed forwards or

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55. In what particulars do the Honey-Buzzards differ from other birds of the tribe of Falcons?

56. Does the Secretary properly belong to the tribe of Falcons?

57. Where is the Secretary found? What are its habits?

58. What are the zoological characters of the birds of the family of Nocturnæ? What is the character of the pupil?

backwards at will. The apparatus of flight is not strong, the fourchette is weak, and the feathers are armed with soft beard, and are covered with a very fine down; the gizzard is somewhat muscular.

59. These birds which are often designated under the collective name of OWLS,—*Strix*,—are blinded by broad day, and only see well in the twilight, or at night when it is not very dark, the time they choose for hunting; and as their silky feathers permit them to fly without noise, it is very easy for them to obtain possession of birds and small mammals upon which they suddenly pounce; there are some species that hunt even in the day time, but during this period they generally retire into hollow trees or rents in walls; sometimes they lay squat on branches of trees, and then all the little birds, of which they are the terror during twilight, come to tease and insult them. During the night they often utter plaintive cries, which the vulgar regard as unfortunate omens; but in reality these birds are more useful than injurious to agriculture, on account of the number of small mammals of the order of rodentia which they destroy. It is probable, the large size of the head, and their habitual tranquility, obtained for them the reputation for wisdom which they enjoyed among the ancients.

60. All the nocturnal birds of prey resemble each other very much, and the differences observed pass from one to the other by such insensible intermediate shades that it is difficult to establish good generic differences in this family.

61. OWLS PRORERLY SO CALLED,—Eared Owls,—*Otus*,—(*Plate* 3, *fig*. 2.) have the disk of fringed feathers which surrounds the eyes, very complete, and itself bordered by a circle of scaly feathers; they have moveable tufts half the length of the head, the external ear very large and furnished in front with a membranous operculum, and the feet are feathered to the nails. The common owl,—*Strix otus*,—is frequent in France and the United States; its length from the top of its head to the end of the tail is thirteen or fourteen inches, and its plumage is yellow with brown spots. It ordinarily inhabits forests, and establishes its retreat in caverns, deserted houses, in ruins, and during the whole night utters sad and plaintive groans; it often takes possession of nests abandoned by crows, ducks, &c.

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59. Why are Owls designated as nocturnal birds of prey? Upon what do they feed?

60. Are the generic differences found in Nocturnal birds of prey easily recognised?

61. How are Owls properly so called characterised?

62. The Howlers,—*Ulula,*—only differ from the preceding owls in the absence of the tufts of feathers, which in common language, are sometimes called horns.

63. The Screech Owls,—*Strix,*—resemble owls properly so called in the disposition of their ears, but are distinguished from them by the beak, which is elongated and curved only at the extremity, while in the other nocturnæ it is arched from its base. They are without tufts, and instead of feathers, have only hairs on the toes. The common species in France, known as the screech owl (*effraie,*) is of all the owls, most especially regarded by the people as a bird of evil omen; its plumage is yellow, shaded with ash colour or brown above, and prettily spotted black and white. It is found in Asia and America as well as in Europe.

64. The Hooting Owls,—*Syrnium,*—differ from the screech owls in their auditory conch which is reduced to an oval cavity, that does not occupy the half of the height of the cranium; their feet are feathered down to the nails.

65. The Ducs, or Horned Owls,—*Bubo,*—have tufts like the eared owls, and an auditory conch as small as the hooting owls, but they have the disk of feathers around the eyes less marked than the preceding owls. The *Grand Duc,* or Great Horned Owl of naturalists,—*Strix bubo,*—is about two feet long, and is the largest of all the nocturnæ; it is common in the great forests of the eastern parts of Europe, and is also met with in France. Its food consists ordinarily of moles and small animals of the order rodentia, but we are assured that it sometimes attacks young roe-bucks, and it often contends with buzzards, and carries off their prey. The great horned owl of the United States,—*Bubo virginianus,*—which is found in all parts of our country, feeds on the gallinaceous birds, domestic poultry, hares, opossums, &c.

66 In former times, this owl was employed in falconry to attract the kite; they tied a fox's tail to the Duc to render its figure still more extraordinary; it flew even with the ground and alighted in the fields without perching on trees; the kite, which perceived it from a distance, came and approached the Duc, or Great Horned Owl, not to attack, but rather to examine it, and kept near it long enough to be taken by the hunters or by the birds of prey which they let slip in pursuit.

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62. How do the Howlers differ from Owls properly so called?

63. How are Screech Owls characterised?

64. In what particulars do the Hooting Owls differ from the Screech Owls?

65. How are the Horned Owls characterised? Where is the Great Horned Owl found? Upon what does it feed?

66. In what way was the Great Horned Owl employed in Falconry?

67. The owls of the genera Noctua and Scops, have the opening of the ear larger than ordinary birds, and the disk of feathers around the eyes smaller and less complete than in all the preceding owls. These characters coincide with the peculiarities of their habits, which bring them near to the diurnal birds of prey. In fact, many owls see sufficiently well in the day to distinguish and pursue their prey. The *Scops* have the heads furnished with tufts. There is one species found in France, whose plumage is ash colour, spotted black.

LESSON IV.

Order of Passerinæ.—*Zoölogical Characters.—Habits.—Division into five families.*

Family of Dentirostres.—*Shrikes.—Flycatchers.—Cotingas.—Blackbirds.—Thrushes.—Water-thrushes.—Orioles.—Lyres.—Warblers, (such as the Nightingales, Linnets, and Wrens.)*

Family of Fissirostres.—*(Swallows)—Habits.—(Swallow, properly so called, Martin.)—Goatsuckers.—Habits.*

Family of Connirostres.—*Larks.—Titmouse—Buntings.—Sparrows.—Crows, (Crow properly so called, Jackdaw, Magpie, Jay.)—Birds of Paradise.*

ORDER OF PASSERINÆ.

1. This order includes all birds that are neither swimmers, waders, climbers, rapaceous, nor gallinaceous; that is, it contains all birds that are not assigned to the other five orders; we find its characteristics, therefore, are purely negative; yet, although we cannot unite all the species that belong to it under a common description, they nevertheless naturally resemble each other in the totality or assemblage of their organization. The Passerinæ have neither the violence of the birds of prey, nor the fixed regimen of the gallinaceous or aquatic birds; insects, fruits and grains constitute their food, which consists more exclusively of grain, in proportion to the largeness of their beak, and more exclusively of insects as it is more slender; and those that have strong beaks pursue

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67. How are the genera of Noctua and Scops characterised? Are all Owls incapable of seeing in the daylight?

1. What are the characters which distinguish the Passerinæ from other orders of birds? Upon what do they feed? What is the number and arrangement of their toes?

even small birds. The proportional length of their wings, and the extent of their flight are as variable as their habits. They have four toes, three before and one behind, and occassionally, two before and one behind, and sometimes all four are in front; but there are *never two before and two behind*, as in the next ORDER; and the middle toe is joined to a greater or less extent, to the external toe by means of a membrane.

2. The order of Passerinæ is very numerous, and is divided into five families, which may be distinguished by the following characters:

				(Families.)
PASSERINÆ, having	The external toe shorter than the middle one, and free for the greater part of its length. Superior mandible,	Notched on both sides near its point.		DENTIROSTRES.
		Without a notch.	Short, wide, flattened, horizontally, and very open.	FISSIROSTRES.
			Strong and conical,	CONIROSTRES.
			Slender and elongated	TENUIROSTRES.
	The external toe almost as long as the middle one, to which it is united as far as to the penultimate articulation.			SYNDACTYLÆ.

[illegible]

FAMILY OF DENTIROSTRES.

3. This family includes those Passerinæ only that have the beak notched on both sides near the point; they are all insectivorous, and most of them also eat berries and other tender fruits. They have been classed according to the general form of their beak, and in this way divided into many tribes, the chief of which may be recognised by the following characters:

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2. Into how many families is the order of Passerinæ divided? What is characteristic of the Dentirostes? How are the Fissirostres distinguished? How do the Conirosters differ from the Fissirostres? What is the character of the beak in the Tenuirostres? How are the Sandactylæ distinguished from the other four families of Passerinæ?

3. What are the general characters of the Dentirostres? (*Answered in the Table.*) How are the Shrikes recognised? By what characters are the Flycatchers known? How are the Contingas distinguished? How are Tanagers characterised? What are the characters of the Ant-catchers? How are the Thrushes distinguished? By what are the Orioles known? How are the Warblers recognised? In what tribes of the family of Dentirostes is the external toe free? How are Cocks of the Rock known?

						(Tribes.)
Dentirostres, having the external toe	Free, and the beak	Strong and moderately large at the base; the superior mandible	More or less hooked at the end, and strongly notched near the point.	The beak conical or laterally compressed and perceptibly hooked at the end.		**Shrikes.**
				The beak broad, horizontally depressed and moderately long.	Straight and moderately long.	**Fly-Catchers.**
					Slightly arcuate, and rather shorter than in the preceding.	**Cotingas.**
				The beak round, large and conical,		**Tanagers.**
			Without a hook at the end, and feebly notched.	Legs long, - - - - - - - - -		**Ant-Catchers.**
				Legs moderate, - - - - - - -		**Thrushes, &c.**
				Legs short, - - - - - - - - -		**Orioles.**
		Very thin, straight, and similar to a bodkin, - - - - - - - - - -				**Warblers.**
	United to the middle toe, about one third of its length from the base, - - - -					**Cocks of the rock, &c.**

4. The Shrikes,—*Lanius*,—have a moderate, but strong beak, which is straight from its origin, and very compressed; the upper mandible is strongly curved towards the point where it forms a hook, and is armed with a deep notch; its base is provided with stiff hairs, and is destitute of cere. Though small in size, these birds are full of courage; they contend with birds of prey, and, like them, live by rapine. They feed on insects and small birds, and always inhabit the woods and bushes on the planes; they live in families, and fly irregularly, and precipitately, uttering shrill cries. There are five species in Europe, and several in America. The common or *Great Shrike*,—*Lanius excubitor*,—which is ash coloured above, white beneath, and of the size of a Thrush; and the *Butcher Bird*,—*Lanius collurio*,—which is smaller than the others, has the back and wings fawn colour; this last bird destroys a great many small animals, birds and young toads, as well as a number of insects, grasshoppers, beetles, &c., which it has the habit of sticking on the thorns of bushes, in order to devour them at leisure, or to find them again when wanted. This little Shrike makes its appearance in the spring, and quits France and the United States in the autumn.

The *cassicans* and *vangas*, and several other genera are grouped in this tribe, and have similar habits.

5. The Fly-catchers,—*Muscicapa*,—are found in all parts of the world. Their beak is moderate, strong, and compressed towards the point, which is curved, and deeply notched; the base is furnished with long, stiff hairs, that cover the nostrils, which are lateral and oval. These birds are travellers. They feed on small birds, or on insects, which they catch on the wing; they alight on trees in the forests. Europe possesses a great many species.

6. The name of *Tyrant*,—*Tyrannus*,—is given to those fly-catchers of America, that have a strong beak; other birds of this division on the contrary, have a very slender beak. They defend their young even from the eagle, and drive all birds of prey from their nest. The larger species feed on small birds, and do not always despise carrion.

7. The Cotingas, or Crown Birds,—*Ampelis*,—are for the most part, remarkable for the beauty of their plumage. Their beak is short, slightly depressed, a little convex above, and sud-

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4. What are the characters of Shrikes? What are their habits? Upon what do they feed? From what circumstance does the Butcher bird derive its name?

5. What are the characters of the Flycatchers? On what do they feed?

6. What are Tyrants? What are their habits?

7. What are the characters of the Cotingas?

denly flexed at the point; their nostrils are half closed by a membrane, and covered in a degree by the hairs of the face; their feet are moderate: all the species belong to South America. The plumage of the male is, in general, adorned with the richest tints of purple and azure; but these birds are not in all their beauty except in the spring, for during the rest of the year their tints are gray or brown.

8. The *Chatterers,—Bombycilla,*—have the head ornamented with a toupet of feathers. There is one species, the Bohemian Chatterer,—*Ampelis garrulus,*—that visits Europe in flocks, at long and irregular intervals, from which circumstance, its presence for a long time was considered as an evil omen. It is thought to inhabit the extreme north. The flesh is esteemed a great delicacy. The *Cedar Bird,* or *Cherry Bird,—Bombycilla carolinensis,*—is found throughout the American continent. Some of them remain in Pennsylvania and New Jersey during the winter.

9. The TANAGERS,—*Tanagra,*—are small birds, remarkable for the most part, for the varied colour of their plumage. They resemble the Finches in their habits, and feed on grain, as well as on berries and insects. The *Summer Red Bird,—Tanagra æstiva,*—is of a vermillion red. It passes the greater part of the year in the tropical America. It is met with in the sandy, barren forests of New Jersey, in small numbers.

10. The THRUSHES,—*Turdus,*—have a moderate beak with a sharp compressed point, but not forming a hook, and having the notches not so deep as in the Shrikes; they are more frugivorous. It is to be remarked also, that their nostrils are half closed by a naked membrane, and the tarsi are longer than the middle toe. Some remain in the country where they are born; others travel in numerous flocks. The flesh of most of these birds is much esteemed.

11. We apply the name of *Thrushes properly so called* to those species in which the colours are uniform or distributed in large masses, and we call those *Thrushes* in which the plumage is dappled, that is, marked with small black and brown spots.

12. The *European Blackbird,—Turdus merula,*—is found in France throughout the year; the male is entirely black with a yellow beak, and the female is brownish. These birds are the first to hail with their songs the return of spring; heard at a

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8. What are the Chatterers?
9. What are Tanagers?
10. What are the characters of Thrushes?
11. How are the two kinds of Thrushes distinguished?
12. What are the habits of the European Blackbird?

distance they are very agreeable; they possess the power of passing from the lowest to the highest tones. In captivity their voice loses its brilliancy and becomes even hoarse and false. This blackbird loves solitude; it only keeps in the thickest and most distant copses. It feeds on worms and insects, and very adroitly breaks snail shells against rocks or stones. The female constructs her nest with great art, which is well cushioned on the inside and covered on the outside with grass. She ordinarily lays four or five blue eggs, covered with brown spots.

13. The *Grive*, or *Common Thrush*,—*Turdus musicus*,—somewhat smaller than the preceding, is brown on the back, reddish yellow with black spots on the neck and breast, white on the belly and flanks, with black spots; the wings are brown above, yellow beneath; the beak is brown, and the tarsi are brownish gray. It is met with in France only as a bird of passage; it arrives there in great flocks at the end of September, and sojourns nearly a month; then it returns in March and April to disappear again in May. A few individuals however, remain, and build on low trees or bushes; they lay two or three times a year, from four to six eggs each time. The song of the Thrush is agreeable, and its flesh is delicate; it announces the return of spring, and remains during three quarters of the year. It is often heard when the skies are heavy with clouds; which circumstance has gained for it, in some countries, the title of bird of storms. When this Thrush is disturbed, his hoarse and noisy song seems to be a mixture of warbling and cries. In its ordinary condition, its gammut is, on the contrary, a scale of soft and grave tones: it often sings many hours together without the slightest interruption. When reared with the Linnet and Nightingale, it seems to study their song, and ends by appropriating it. The *American Robin* or *Migrating Thrush*,—*Turdus migratorius*,—is found in summer throughout the North American continent. The Robin Red-breast, which is said to have covered, with a leafy shroud, the lost and wandering "babes in the wood," is held in universal respect. Its song, however, has not the compass and variety of the preceding species.

14. The *Missle Thrush*,—*Turdus viscivorus*,—the *Litorne*,—*Turdus pilaris*,—and the *Mavis*,—*Turdus iliacus*,—are three other species of Thrush which are also found in Europe.

15. The *Mocking Bird*,—*Turdus polyglottus*,—an American bird, celebrated for the astonishing facility with which it un-

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13. What are the habits of the Grive or Common Thrush?
14. What other Thrushes are found in Europe?
15. What is the Mocking bird?

hesitatingly imitates all the sounds it hears, also belongs to the tribe of Thrushes.

16. The Water Thrushes,—*Cinclus*,—have a cutting, straight, elevated beak, compressed and rounded towards the end, with the point of the upper mandible bent over the lower one. There is but one species in Europe, which has the singular habit of descending into the water, without swimming, but walking about the bottom in search of small animals upon which it feeds. The *American Water Ousel*, or *Dipper*,—*Cinclus Americanus*,—is cinereous gray, with a blackish brown head and neck. It is distinguished from the European species by the absence of the white on the chin and throat. Of the particular habits of this bird little is yet known.

17. The Ant-Catchers,—*Myothera*,—so called because they live chiefly on ants, are recognised by their long legs and short tail; they are found on both continents.

18. The Orioles,—*Oriolus*,—resemble the thrushes very much, but their beak is a little stronger, their legs are shorter and their wings a little longer in proportion

19. The *European Oriole*, or *Golden Thrush*, the *Yellow Thrush* of the Germans,—*Oriolus galbula*,—is of nearly the same size as the thrush, (nine or ten inches long, and the spread of the wings about sixteen.) The male is of a beautiful yellow; the wings, the tail and a spot between the eye and beak are black, and the end of the tail is yellow; but during the first two years of life, like the female at all times, he has an olive in place of the yellow, and brown in place of the black colour. This bird suspends its nest, which is very artfully constructed, from the branches of trees; in the summer it eats cherries and other fruits, but in the spring it feeds on insects: it remains in Europe only during the warm season, and goes to Africa to pass the winter. It migrates in companies of five or six. In the summer, when it has become fat, its flesh is good to eat, and were it not so difficult to rear, it would be the ornament of our cages for its beauty. The *Baltimore Oriole*, or *Golden Robin*,—*Oriolus baltimore*,—*Icterus baltimore*,—comes amongst us from its winter retreats in South America, about the first week in May. It bears a general resemblance to the preceding.

20. The Lyres,—*Mænura*,—have been placed with the gallinaceous birds by some naturalists who were more struck with their

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16. What are the characters of the Water Thrushes?
17. How are the Ant-catchers recognised?
18. What are the characters of the Orioles?
19. What are the characters of the European Oriole? What are its habits?
20. What are the Lyres? From what do they take their name?

large size than the disposition of their feet and other characters; but in reality these birds approach much nearer to the thrushes, from which they scarcely differ in the form of their beak. They are distinguished by the singular conformation of the tail of the male bird, the different feathers of which exactly resemble a Lyre. These birds belong to New Holland; only one species is known.

21. The WARBLERS,—*Motacilla*,—are extremely numerous in species, which are found in all countries. They have a straight, slender beak, in the form of a bodkin, higher than it is broad at the base; the point of the upper mandible is often notched, and the lower one is straight; the nostrils are half closed by a membrane; the tarsi are longer than the middle toe. Birds of this genus are emphatically singers; they are almost all migratory, and insectivorous. They are divided into many sub-genera, among which we may mention:

22. The *Traquets*,—*Saxicola*,—are lively birds that stand tolerably high on their legs; the French species build on the ground and feed exclusively on insects: such are the *Common Traquet*,—*Motacilla rubicola*,—and the *Wheat Ear*,—*Motacilla œanthe*.

23. The *Rubiettes*,—*Sylvia*,—live on insects, worms and berries; they are solitary, and generally build in holes; the *Stonechat*,—*Motacilla rubicola*,—belongs to this sub-genus.

24. In the division of *Fauvettes*,—*Curruca*,—the beak is more slender than in the *traquettes*, or *rubiettes*. The most interesting species of this little group is the *Nightingale*, — *Motacilla luscinia*,—the plumage of which is reddish brown above, and whitish gray beneath, the tail being a little red. This bird, whose song is so celebrated, never lives in flocks. The female constructs her nest, in the foliage, of straw and moss; she ordinarily lays two or three times a year, and four or five eggs on each occasion. While she is sitting, the male, perched upon a neighbouring branch, endeavours to relieve the weariness of her task by the harmony of his voice; if an enemy approach, he continues to sing, and his interrupted accents tell his companion all she has to fear. In the silence of the night, when all other birds have suspended their concerts, the melodious voice of the Nightingale alone is heard; and the variety, the sweetness and harmony of his notes place him in the first rank of singing birds.

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21. What are the characters of the Warblers?
22. What are the Traquets?
23. What are the habits of the Rubiettes?
24. What are the characters and habits of the Nightingale?

25. The ***Fauvette,—Motacilla orphea,***—which is ashy brown above, whitish beneath, is common in Europe, and particularly in the southern provinces of France, which it leaves in flocks, about the middle of autumn, to return in the spring. It feeds on insects and soft fruits, and makes its nest in the bushes or reeds; the male has a strong, sonorous voice, which is not disagreeable. Its song, says Buffon, somewhat resembles that of the Nightingale, and is enjoyed for a long time; for, many weeks after the songster of the spring-time is hushed, the woods every where resound with the song of the fauvette; its voice is smooth, pure, and light, and its succession of modulations, though of small extent, are agreeable, flexible, and graduated.

26. The *Wrens,—Regulus,*—are little birds that keep on trees, and there pursue gnats. The *Roitelet*, or *Kinglet,—Motacilla regulus,*—is the smallest of European birds; the head of the male is adorned with a small yellow tuft bordered with black.

27. These birds possess a great deal of activity and agility; they are almost always in motion; they leap from branch to branch, climb trees on all sides, they eagerly hunt in all the cracks of the bark, and sometimes they suspend themselves, feet upwards like the tom-tit; they feed on insects, little worms and various small grains. The female lays from ten to eighteen eggs which scarcely exceed a large pea in size; her nest of leaves is placed on the branches of the fir-tree, in such a manner as to be swayed in all directions by the wind.

28. The *True Wrens—Troglodytes,*—have the middle toe rather long, and the nails of moderate length. They are remarkable for their almost domestic habits, often building from preference about houses, either empty or inhabited; they also sing agreeably; species are found on both continents. The *House Wren,—Troglodytes aedon,—Sylvia domestica,*—is only a summer resident of the United States; but the *Winter Wren,—Troglodytes hyemalis,*—sometimes passes the winter in Pennsylvania.

29. The *Wag-tails,—Motacilla,*—are remarkable for the length of their tail, which they are constantly elevating and depressing.

30. The *Meadow Larks*, or *Titlarks,—Anthus,*—somewhat resemble the larks, (*Alauda*) on account of the long nail with which their thumb is armed.

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25. What are the habits of the Fauvette?
26. What are Wrens?
27. What are the habits of Wrens?
28. What are the characters of the true Wrens?
29. How are the Wag-tails characterised?
30. In what respect do the Meadow Larks resemble the Larks?

31. The *Common Titlark,—Anthus pratensis*, or *Alauda pratensis*,—frequents humid prairies and becomes extremely fat in the autumn; in many parts of France it is then sought, and is known under the name of *Bec-figue,—becca-fica.*

32. The Cocks of the Rock,—*Rupicola*,—are distinguished from all the preceding species of the family of Dentirostres, by having the two external toes, united for about one third of their length from the base. The two American species, when full grown, are of a beautiful orange colour, and have a double vertical crest on the head, formed of feathers arranged like a fan. They are found in the warm parts of South America.

FAMILY OF FISSIROSTRES.

33. The Fissirostres are distinguished by their beak, which is short, wide, horizontally flattened, slightly hooked, without a notch, and very deeply cleft, that is, the commissure, or line of junction between the two mandibles, is extended so that the opening of the mouth is very wide, and they easily swallow the insects they pursue on the wing. All these birds are exclusively insectivorous; they are also migratory, and migrate in the temperate zones. Their flight is the most extended of all terrestrial birds; they are found in all parts of the world.

34. This family is divided into two tribes, namely:

35. First. The Diurnal Fissirostres, with a dense plumage, and a beak that opens to beneath the eyes.

36. Second. The Nocturnal Fissirostres, the plumage of which is soft and light like that of the owls, and their beak opens to a point beyond the eyes.

37. The Diurnal Fissirostres constitute the Genus of Swallows,—*Hirundo*,—all of which are remarkable for the length of their wings; this genus is sub-divided into swallows properly so called, and Swifts; the latter have a remarkable conformation of the claws; the thumb is directed forward almost like the other toes which are all separate, and each one has but three phalanges; while in the swallows properly so called the thumb is inserted behind the tarsus, and preserves the same direction as in the

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31. What are the habits of the Common Lark?

32. How are Cocks of the Rock characterised?

33. What are the distinguishing characters of the Fissirostres? What are their habits?

34. Into how many tribes is the family of Fissirostres divided?

35. How are the Diurnal Fissirostres characterised?

36. How are the Nocturnal Fissirostres distinguished from the Diurnal?

37. How are Swifts and Swallows properly so called, distinguished from each other?

other Passerinæ; the external toe is united to the median, as far as the first articulation, and the number of phalanges is not unusual.

38. SWALLOWS PROPERLY SO CALLED,—*Hirundo*,—have a triangular beak, broad and depressed at the base, a little curved at the point, the nostrils oblong, the legs short, the wings very long, and the tail ordinarily forked. These birds delight most in those places where flies and other winged insects are common: they construct their nests with great care, often of a sort of masonry in the ground; the female sometimes lays twice a year. Most of the Swallows leave us towards the end of September, and migrate in large flocks to warm countries where they pass the winter; but return in the beginning of the spring and take possession of the nests they had left the preceding year. Their habits are mild, and they are remarkable for their sociability. They often join a great number together, to drive off an enemy, the attack of which any one of them may fear. The Swallow announces even to Swifts, and other small birds the approach of a bird of prey. At the sight of an owl or a hawk, it utters a piercing cry; immediately all the birds of its species, and the Swifts assemble around it, and often march in line against the enemy, which they harass until he is forced to beat a retreat.

39. In the genus of Swallows we must mention, the Martin,—*Hirundo urbica*,—(*Plate* 4. *fig.* 1.) which is black above, white below and on the tail, and the feet are feathered to the nails. It arrives about the middle of April, and disappears about the middle of September. It constructs its nest of earth, lined inside with straw and feathers, which it often places in the angles of windows and beneath the eaves.

40. The *Chimney Swallow*,—*Hirundo rustica*,—is an inch longer than the preceding, with a very forked tail and naked toes; it is black above; the front, that is the forehead, throat, and brows are red, and the rest of the bird is ordinarily white. It arrives a little earlier than the preceding, constructs a similar nest, which it commonly places on chimneys, in stables and barns.

41. The *Salangane*, or *Edible Swallow*,—*Hirundo esculenta*,—which inhabits the East Indian archipelago, is celebrated on account of its nest, which it constructs of a whitish, gelatinous substance, arranged in layers; this substance is a marine plant which it soaks in the sea and grinds previously to using. These nests are eaten, dressed like mushrooms, and in soup; the Chinese

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38. What are the habits of Swallows properly so called?

39. What is the Martin? What are its habits?

40. What are the characters of the Chimney Swallow?

41. What is the Salangane? For what purposes is the nest of this Swallow used?

regard them not only as an excellent dish, but also as a very restorative and medicinal kind of nourishment; a very extensive commerce is carried on in this article, which has been sold as high as five dollars a pound. From thirty to fifty thousand pounds are used in China every year.

42. The SWIFTS,—*Chœtura*, or MARTINS, or *Martinets*,—*Cypselus*,—have a forked tail which consists of six quills only, while in the Swallows properly so called there are twelve; their legs are very short and their toes are directed forwards. These birds scarcely walk at all, and are seen constantly in the air, pursuing, in flocks, and with loud cries, insects in the upper regions of the atmosphere. They nestle in holes in walls, and in rocks, and climb along smooth surfaces with great rapidity

43. The *Common Martin*,—*Hirundo apus*,—is about eight inches long, and the spread of the wings is nearly fifteen inches. It is black with a white throat. It appears in France in the month of April, and departs on the approach of cold. It ordinarily lays from two to five eggs once a year.

44. The tribe of NOCTURNAL FISSIROSTRES is composed of the genus of *Goatsuckers*.

45. The GOATSUCKERS,—*Caprimulgus*,—(*Plate* 4. *fig.* 2.)—all resemble each other in their plumage and habits. They only appear towards evening, and, for this reason, they might be called crepuscular birds. The silky nature of their feathers, and their mixed and delicate colours, give them, as far as relates to their external covering, a strong resemblance to owls. Their eyes are large; their beak, which is furnished with strong mustaches, and more deeply cleft or open than in swallows, is capable of receiving the largest insects which it retains by means of a viscid saliva; the nostrils, which are in the form of small tubes, are near its base; their wings are long, their feet short, and the tarsi feathered; the thumb can be directed forward.

46. These birds live isolated, and only fly during the twilight, or in fine nights; they pursue the phalenæ and other nocturnal insects, and lay a small number of eggs on the ground without taking much care to construct a nest. When they fly, the rushing of the air into their wide mouth produces a peculiar humming noise. It has been said that they sucked the goats, but this is untrue; the notion arose probably from their frequenting the

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42. How are the Swifts distinguished from the Swallows?
43. What are the characters of the common Martin?
44. What genus constitutes the Nocturnal Fissirostres?
45. What are the characters of the Goatsuckers?
46. What are the habits of the Goatsuckers? From what circumstance do they derive their name?

fields, where goats and sheep were herded, in pursuit of the insects which are attracted there in great numbers. Only one species of Goatsucker is known in Europe.

47. The *European Goatsucker,—Caprimulgus europœus,—* (*Plate* 4. *fig.* 2.) is of a brown gray, undulated with blackish brown, with a whitish band running from the beak to the back of the neck. It arrives in France in the spring, nestles in the heath, and the moment its food begins to grow scarce it seeks a warmer climate.

48. There is one species in Africa, remarkable for a feather twice the length of the body which arises from near the carpus of each wing, and is barbed only near the extremity. The warm parts of America abound in these birds.

49. The *Chuck-will's Widow,—Caprimulgus carolinensis,—* appears in the southern parts of the United States about the middle of March. The head and back are dark brown, minutely mottled with yellowish red, and longitudinally streaked with black.

50. The *Whip-poor-will,—Caprimulgus vociferus,*—is heard during the spring and early autumn, in the middle section of the United States. Its general colour is a brownish gray, streaked and finely sprinkled with brownish black. About the middle of May, the female lays two eggs; like all birds of this genus, she builds no nest, but deposites her eggs upon the bare ground, in some dry and sequestered situation.

51. The *Night-Hawk*, or *Night-Jar,—Caprimulgus Americanus,*—is met with in all parts of the United States. It is of a brownish black, mottled with white, and a pale reddish brown above, and a grayish white, undulated with dark brown below. Night-Hawks arrive in the Middle States towards the close of April. They are commonly seen towards evening in pairs, sailing around in sweeping circles, high in the air, occasionally descending lower to capture flying insects, chiefly of the larger kind, such as wasps, beetles and moths. About the middle of August, they begin their migrations towards the south, and may be seen as late as the middle of September, in the evening, in scattered flocks, consisting of several hundreds together, moving towards more congenial climes, darting after insects, or feeding leisurely as they advance. Sometimes different species of Swallow are mingled in these wandering tribes.

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47. What are the characters of the European Goatsucker?
48. Are Goatsuckers peculiar to Europe?
49. What are the characters of the Chuck-will's widow?
50. What is the Whip-poor-will?
51. What is the Night Hawk?

FAMILY OF CONIROSTRES.

52. All the birds of this family have a strong beak, more or less conical, and without a notch, (*Plate* 3. *fig.* 9.): they live on grains, more exclusively in proportion to the strength and thickness of their beak. The principal genera of this family are; the Larks, the Titmice, the Buntings, the Sparrows, the Crossbills, the Crows, and Birds of Paradise, which may be distinguished by the following characters:

				(Genera.)
Conirostres, having the nail of the posterior toe	**Straight, strong, and longer than that of the other toes,**			**Lark.**
	Of ordinary size. Beak	Short, straight and conical.	Very slender, and furnished with hairs at the base.	**Titmouse.**
			Pretty strong, and furnished inside with a hard tubercle, fixed to the palate.	**Bunting.**
			Strong, and more or less thick at the base; upper mandible inflated.	**Sparrow.**
		Compressed, and the mandibles crossing each other.		**Crossbill.**
		Very strong, and more or less flattened on the sides; nostrils covered by	Stiff feathers, directed forwards.	**Crow.**
			Feathers, which resemble velvet.	**Bird of Paradise.**

53. The Larks,—*Alauda*,—have a straight, short beak, in the form of an extended cone, (*Plate* 4, *fig.* 4.); their head is small, round, and furnished with feathers on top, which are more or less erectile; their tail is of moderate length, and almost always forked; their nostrils are covered by small feathers which are directed forwards; the posterior nail is straight, strong, and much longer than that of any of the other toes. The conformation of their nails does not permit these birds generally to alight on trees, but it is useful to them when they run over newly ploughed

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52. How are the Conirostres characterised? Upon what do they feed? What are the principal genera composing this family?

53. What are the characters of the Larks? What are their habits?

ground; they dwell, in general, on the ground, and feed on grains, tender herbs, insects and larvæ. They also have the habit of dusting themselves by fluttering on the ground. The *Common Lark* is found nearly throughout the eastern continent. During the summer, these birds prefer dry elevated situations, and delight in soaring to great heights in the air, singing in a strong, melodious voice. In winter, they assemble in large numbers on the level country in search of food; when the cold is intense they take refuge among the rocks, and along streams that do not freeze, and when pushed by want, they approach our habitations. They nestle on the ground, and without becoming familiar with man, they become accustomed to captivity. Their flesh is esteemed a delicacy.

54. The *Shore Lark,—Alauda alpestris,*—is of a reddish gray inclining to brown above, whitish beneath with the throat and a stripe over the eye of a pale yellow; the tail and wings, and a patch on the breast, black. This beautiful species is common in the northern parts of both continents. These birds arrive in the Northern and Middle States early in October, and generally disappear on the approach of snow.

55. The *Sky Lark,—Alauda arvensis,*—is universally known by its perpendicular mode of soaring, accompanied by its varied and powerful song. It is brown above; whitish underneath, and spotted throughout, with a deeper shade of brown.

56. The TITS, or TITMICE,—*Parus,*—have a slender and very short beak. They are extremely lively little birds; they are constantly leaping from branch to branch in short flights, climbing and suspending themselves in all manner of positions, plucking the grains upon which they feed, also eating many insects, not even sparing small birds when they find them enfeebled by sickness, or entangled in snares; they are often seen to pierce their skulls by repeated strokes of the beak to devour the brains; they also pick the bones to a skeleton. In proportion to their size, which is very small, these are the strongest of all birds; they attack owls fiercely; they have the habit of storing a provision of grains; they nest in the hollows of old trees, and lay more eggs than any other of the passerine birds. Species are found in all parts of the world, and there are several in the United States. The *Tufted Titmouse,—Parus bicolor,*—is crested, and scarcely exists north of Pennsylvania, and New York. It is of a

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54. What are the characters of the Shore Lark?

55. What are characters of the Sky Lark?

56. What are the characters of the Titmice? What are their habits? Where are they found? What are the characters of the Tufted Titmouse?

dark bluish ash-colour above, whitish beneath, and the flanks are tinged of a yellowish brown.

57. The BUNTINGS,—*Emberiza*—(*Plate* 3, *fig.* 9.) have a short, straight, conical beak, the upper mandible being narrower, enters within the lower, and there is a projecting hard tubercle on the palate. All these birds are granivorous, yet they also eat insects; they inhabit thickets, fields covered with hedges, gardens, and the woods rarely. They have little foresight, and are readily caught in traps. Some of them assemble in numerous troops in the winter. The most common species in France are the Yellow Bunting,—*Emberiza citrinella*,—the Common Bunting,—*Emberiza miliaria*,—and the Ortolan,—*Emberiza hortulana*,—and there are several in the United States. Amongst the latter may be mentioned here, perhaps, the *Rice Bird*, or *Bob-o-Link*,—*Emberiza oryzivora*, or *Dolichonyx oryzivorus*.

58. The SPARROWS have a conical beak which is more or less thick at the base; they generally live on grains, and are for the most part voracious and destructive. They are divided into Sparrows properly so called, Weavers, Linnets, Goldfinches, &c.

To the genus of SPARROWS PROPERLY SO CALLED,—*Pyrgita*,—belong:

59. The *Common Sparrow*,—*Fringilla domestica*,—which is brown, spotted blackish above, with a whitish band on the wing, gray beneath, the sides of the crown in the male reddish, and his throat black. It abounds in all parts of the eastern continent, except in those places where wheat does not grow; this bird nests in holes in walls, and is very destructive from its voracity. The farmers complain very much of the pillage of these birds; the destructive war they wage against caterpillars, and winged insects, compensates, however, for their passing devastations; and every thing considered, it may be said they are more beneficial than injurious to rural economy. The sparrow is courageous, and often contends with birds ten times larger than itself, and sometimes enters dove-cots These birds ordinarily nest under eaves or in hollows of trees: the nest is constructed of hay and straw, lined with feathers; it is placed so as not to be injured either by the sunshine or rain. The tenderness of the female for her young is very interesting. The male is distinguished from the female by a black spot on the beak.

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57. What are the characters of the Buntings? What are their habits?

58. How are the Sparrows characterised?

59. What are the characters of the common Sparrow? What are its habits? Where is it found?

60. The *Common Chaffinches,—Fringilla cœlebs,*—are among the most common of European birds; their habits are nearly the same as those of the common Sparrow, but they are more lively and their song is more varied.

61. The *Common Goldfinch,—Fringilla carduelis,*—is among the most beautiful birds of Europe. It is very docile, and quickly learns to sing, and to play all kinds of tricks.

62. The *Yellow Bird,* or *American Goldfinch,—Fringilla tristis,*—has black wings varied with white, and a black tail tipped with white. In summer, the male is dressed in yellow with a black crown, and in the autumn in brown olive, which is the permanent colour of the female and young yellow birds. It is a general inhabitant of the United States

63. The *Common Snow Bird,—Fringilla hyemalis,*—is a hardy and very numerous species, common to both continents. About the middle of October they pour in flocks from the northern regions into the United States, where their arrival is looked upon as the presage of winter.

64. The *Linnet,—Fringilla canabina,*—is found in all parts of Europe, and chiefly inhabits the planes; its song is very agreeable.

65. The *Canary Bird,—Fringilla canaria,*—somewhat resembles the Linnet, though it differs from it very much in colour. It sings so agreeably, and is so easily multiplied in a state of captivity, that it has become common throughout the world. Most naturalists agree that it came originally from the Canary Islands, where it is found wild in great numbers; but some travellers suppose that it was first brought from Asia.

66. The GROSBEAKS,—*Caccothraustes,*—are distinguished from other Sparrows by the great size of their beak which is exactly conical. The *Common Grosbeak,—Loxia caccothraustes,*—is the most strongly characterised. It inhabits woody mountains and eats almonds and all sorts of fruit.

67. The BULLFINCHES,—*Pyrrhula,*—have a round beak which is inflated in every direction, and sufficiently strong to crush the hardest seeds.

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60. How does the Chaffinch differ from the Common Sparrow?
61. What is the common Goldfinch?
62. What is the American Goldfinch?
63. What is the common Snow Bird?
64. What is the Linnet?
65. Where did the Canary Bird come from originally?
66. How are the Grosbeaks distinguished from other Sparrows?
67. How are Bullfinches characterised?

68. The Crossbills,—*Loxia*,—resemble the Bullfinches, but the mandibles of the beak are so much curved at the point that they cross each other. By this singular beak they are enabled to tear out the seeds from under the pine-cones. The *Common Crossbill*,—*Curvirostra Americana*,—is found inhabiting the extensive pine forests in the interior of Pennsylvania, and the Northern States, from April to September.

69. The *Beef-eaters*,—*Buphaga*,—make use of their beak, which is inflated at the end, to compress the skin of cattle to squeeze out the larvæ of the œstrus which they eat. Only one species is known, which inhabits Africa.

70. The *Starlings*,—*Sternus*,—have a straight beak, depressed at the point. They also follow cattle and feed on insects. They are found in all parts of the world.

71. The Crows,—*Corvus*,—have a large beak, straight at the base, curved towards the point, and cutting on the edges; their nostrils are concealed by hairs directed forwards, their toes are entirely divided, and their wings are truncate at the extremity. They live in troops, and are cunning and distrustful; they readily become familiar, and learn to speak with considerable facility. The senses of this bird, that of smell particularly, are very acute. They have the habit of stealing and concealing everything they find, even articles which are useless to them, such as small pieces of money; they provide provision for the future season, and feed on every kind of aliment, grains, fruits, insects and worms, living or dead flesh, so that no animal better merits the epithet of *omnivorous*. The principal species of this genus are:

72. The *Raven*,—*Corvus corax*,—is the largest passerine bird found in Europe. Its size is almost equal to that of the domestic cock; its plumage is entirely black, its tail rounded, the back or top of the upper mandible arcuate in front. The female is of a less decided black, and her size is somewhat less. This bird flies well and high; it perceives dead bodies at a great distance, and feeds besides on all kinds of fruits and small animals. It lives very retired, but in pairs, which make their nest in crevices of rocks, or in holes in walls, in old abandoned towers, and sometimes upon the summit of lone trees. The nest is very large,

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68. What are the characters of the Crossbills?

69. From what circumstance do the Beef-eaters derive their name?

70. What are Starlings?

71. What are the characters of Crows? What are their habits? Upon what do they feed?

72. What are the characters of the Raven? What are its habits? What situations does it select for its nest? Where is it found? How does the female differ from the male?

and is composed externally of branches and roots of shrubs; bones of quadrupeds, or fragments of hard substances form the second layer, and the interior is lined with herbs, moss, and hair. About the month of March, the female lays five or six eggs of a pale bluish green colour, marked with a great many obscure spots and tints. The cares of incubation, which lasts about twenty days, are shared by the male. The Raven is met with in all climates; it appears to be insensible to the vicissitudes of the seasons. When other birds are overcome by the cold and oppressed by hunger, it leisurely seeks its prey and hunts in the coldest atmosphere. Some travellers assert that they have seen Ravens that were entirely white; which is apparently attributable to the rigorous climate of northern regions.

73. [The *Crow*, —*Corvus Americanus*,—like the Raven, is a denizen of nearly the whole world. Our native Crow is black and glossy, with violet coloured reflections. It is a troublesomely abundant resident in most of the settled districts of North America. It is easily raised and domesticated, and soon learns to distinguish the different members of the family with which it is associated.

74. [The *Fish-Crow*,—*Corvus ossifragus*,—keeps apart from the common species, and spends its time near rivers, hovering over the stream to catch up dead, and perhaps living fishes. It breeds in New Jersey in tall trees, having nests and eggs very similar to the preceding species.]

75. The *Jackdaw*,—*Corvus monedula*,—is about the size of a pigeon; it is less black than the Crow, inclining even to ash-colour about the neck and below. It inhabits Europe throughout the year, and keeps about the tops of churches, in old towers, in ruined buildings, and sometimes, though rarely, around chimneys; its nests are also found in the hollows of trees, and rabbit burrows. The female lays five or six eggs, which are paler and smaller than those of the Raven. Jackdaws are readily tamed and may be taught even to pronounce words. They like to hide a part of their food, and we sometimes find in their holes small pieces of money which they delight in stealing. They feed on grains, insects and fruits; they are particularly fond of partridge eggs, and they have been known to catch fish.

76. The *Magpie*,—*Pica*,—*Corvus pica*,—is a beautiful bird, of a silky black colour, with purple, blue and gold reflections: it

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73. What are the habits of the Crow?
74. Where is the Fish-Crow found? What are its habits?
75. What are the characters of the Jackdaw? What are its habits?
76. What are the characters of the Magpie? What are its habits?

is white beneath, and there is a spot of the same colour on the wing. The Magpie is omnivorous, and often commits great ravages in granaries and poultry yards. It never attempts long journeys, but flies from tree to tree when at a short distance apart. The female takes great pains in the construction of her nest, never leaving a greater opening than is necessary for her own entrance and egress; she covers it with a transparent veil composed of small thorny branches, closely interlaced; she lines it with wool and other soft materials upon which her young ones snugly repose; she lays seven or eight eggs of a pale gray colour, spotted black. This bird may be easily tamed and taught to pronounce words, and even short sentences; often when a strange sound strikes her ear, she endeavours to imitate it. Like other birds of its genus, it is inclined to theft, and also has the habit of concealing superfluous food. The Magpies are known to make so great a destruction among the eggs of grouse, pheasants, partridges, and even among young chickens, in many parts of Europe, as to be proscribed by law, and destroyed for the premium justly set on their heads. In this country, these birds are confined to the northern regions, and to the planes and table-lands of the Rocky Mountains west of the Mississippi. In Upper California, there is a species which differs from the preceding, in having the bill, and a bare space beneath and behind the eye, yellow. It is called the *Yellow-billed Magpie,—Pica Nuttallii.*

77. The *Jay of Europe,—Corvus glandarius,*—is of a vinous gray, with mustaches, and the quills of the tail black; it is particularly remarkable for a spot of dazzling blue, striped with a deep blue, which marks a part of the wing coverts. Jays are met with that have a white or yellowish plumage and a red iris like that of albinos. This bird is spread almost throughout Europe, where it lives in pairs, which assemble in small troops, and feed on acorns, gooseberries, cherries and insects. The Jays are of a petulent nature; they are very lively, and quick in their motions; and in their frequent paroxysms of rage, they forget their own self preservation, and are sometimes caught by the head betwixt two branches and die, thus suspended in the air; their perpetual agitation leads to increased violence when confined, and for this reason, they are not recognisable in a cage, not being able to preserve the beauty of their feathers, which are soon broken, torn and disordered, by their continual rubbing against its walls. [The elegant and common American species,

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77. What are the characters of the European Jay? What are its habits? What are the characters of the Blue Jay?

the *Blue Jay,—Corvus cristatus,*—resembles the preceding in its temper and habits. It is crested; it is blue above, and beneath whitish with a black collar; the wing coverts are transversely barred black, and the tail is wedge-shaped.

78. [The *Great Crow Blackbird,—Quiscalus major,*—is glossy black. This large crow-like species; sometimes called the Jackdaw, inhabits the southern maritime parts of the United States. It is sociable in disposition, and often mingles with the common Crow-blackbirds. It is omnivorous, and feeds on insects, small shell-fish, corn and small grain, so that by turns, it may be viewed as the friend or plunderer of the planter. The common Crow Blackbird,—*Quiscalus versicolor,*—and the Rusty Blackbird,—*Quiscalus ferrugineus,*—are two other American species of this genus.]

79. Birds of Paradise,—*Paradisæa,*—like the Crows have a straight, quadrangular, pointed beak, which is compressed and a little convex above; their nostrils are covered by the velvety feathers of the front. These birds, which are indigenous to New Guinea and the neighbouring islands, are all provided with the most brilliant plumage. Their history was for a long time a tissue of fable and absurdity. The female, it was asserted, laid her eggs while flying, and had no legs; and when sleeping, it suspended itself from branches of trees by the long thread like feathers of the tail; that it fed exclusively on dew, and never touched the earth till it was dead! All these accounts have found their place, and observation has revealed the truth.

80. The most celebrated species is the *Emerald Bird of Paradise,—Paradisæa apoda.*—Its head is small, but ornamented with feathers that in brilliancy rival those of the peacock; the neck is of a yellowish tint; the body is very small, but covered with long feathers of a brown tint sprinkled with gold, two long bearded filaments or thread like feathers, spring from the rump and form the tail. The long, light, and graceful feathers of this bird form the most beautiful, and most sought plumes for the decoration of ladies' head dresses. These birds travel in troops of thirty or forty under the direction of a chief, which the Indians call the king. Their light plumage does not permit them to fly against the wind, and if overtaken by a gale they rise into the upper regions of the atmosphere, and leave the storm below them.

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78. What are the characters of the Great Crow Blackbird? What are its habits?

79. What are the characters of Birds of Paradise? Where are they found?

80 What are the characters of the Emerald Bird of Paradise? What are its habits?

LESSON V.

Family of Tenuirostres.—*Nuthatches.—Creepers.—Humming Birds.*
Family of Syndactylæ.—*Bee-eaters.—Kingfishers.—Hornbills.*
Order of Scansoriæ.—*Zoological Characters —Woodpeckers.—Wrynecks.—Cuckoos.—Toucans.—Parrots.—Habits, (Maccaws, Paroquets, Parrots properly so called)*

FAMILY OF TENUIROSTRES.

1. Birds of this family have a slender, elongated beak without a notch, and which is sometimes straight, and sometimes arcuate. (*Plate* 3, *fig.* 11.) The principal genera of this family are the Nuthatches, Creepers, Humming-birds, and Hoopoes, which may be recognised by the following characters:

			(Genera.)
Tenuirostres, having the beak	Moderate, and	Straight, ...	Nuthatches.
		Arcuate, ...	Creepers.
	Very long and very slender, tongue	Very long, bifid, and very extensible.	Humming-birds.
		Short, and lying close at the bottom of the throat	Hoopoes.

2. The *Nuthatches*,—*Sitta*,—have a moderate, straight, depressed beak, which is cylindrical, conical, and trenchant at the point; their nostrils are partly covered by hairs directed forwards, and their tongue is short and very slightly protractile. They climb with agility in all directions, live on insects and nestle in the trunks of trees. The *Common European Nuthatch*,—*Sitta Europæa*,—is of a bluish ash-colour. It is sedentary, and inhabits the lofty forests. The male joins the female in the spring, in constructing the nest; they establish themselves in a hole in a tree, and if the hole is too large, they reduce it with mud, which circumstance has acquired for it the name of *Mason-pie;* they line the interior with a thin bed of moss, upon which the female lays from five to seven grayish eggs, marked

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1. What are the characters of birds of the family of Tenuirostres? What are the principal genera of this family?

2. What are the characters of the Nuthatches? What are the habits of the common European Nuthatch? Upon what does it feed?

with small red spots. It is said, she is so much attached to her eggs, that she never leaves them during the whole period of incubation, and takes no other food than that brought to her by the male. The young escape from the shell about the month of May, and very soon retire to live by themselves. These birds feed on insects, grains, hazel-nuts, beech-nuts, flax-seed, &c. The mode of getting out the substance of the hazel-nuts, consists in fixing them solidly in a crack, and then piercing them by repeated blows with their beak.

3. [In the United States we have the *White-breasted Nuthatch,—Sitta carolinensis,*—which is lead colour, with the head and neck black above, and pure white beneath; the *Red-bellied Nuthatch, —Sitta canadensis,*—which is of a rust colour beneath, and some others; all of which, in their general habits, resemble the European species.]

4. The Creepers,—*Certhia,*—have a beak of moderate length, more or less arcuate, triangular, compressed and slender; their nostrils, which are horizontally pierced, are half closed by an arched membrane.

5. The *Creepers properly so called,—Certhia,*—have a slanting tail, which is furnished with stiff, sharp quills; it serves to aid them in climbing trees; their tongue is sharp and adapted for piercing insects upon which they feed. There is one species found in Europe, and one in the United States. The European Creeper,—*Certhia familiaris,*—is a small bird which is met with in different parts of Europe, as far north as Siberia; it is constantly climbing trees in pursuit of insects and larvæ. The *Brown Creeper,—Certhia americana,*—is of a dark gray varied with white, brown and dusky; white beneath; the rump and tail rusty. This industrious forager for insects, chiefly dwelling in the seclusion of the forest, is but seldom seen in summer; but on the approach of winter, with other hungry wanderers of similar habits, such as the small Woodpeckers and Nuthatches, he makes his appearance on the wooded skirts of the village, particularly among pine trees, and occasionally becomes familiar enough to pay a passing visit to the orchard. The species is neither common nor abundant, though their breeding range extends from Pennsylvania to Newfoundland.

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3. What are the characters of the White-breasted Nuthatch? What are the characters of the Red-bellied Nuthatch? Where are these two species found?

4. What are the characters of the Creepers?

5. What are the characters of the Creeper properly so called? What is the European Creeper? What is the Brown Creeper? What are the habits of these birds?

6. There are several sub divisions of this genus. Those known in France under the name of *échelettes*,—*Tichodroma*,—climb like the preceding, but without supporting themselves with their tail, which is feeble and rounded; they keep more on walls and rocks than on trees.

7. The HUMMING-BIRDS,—*Trochilus*,—(*Plate* 3, *fig.* 11.) are celebrated for the beautiful colours and metallic lustre of their plumage, as well as for their small size; they inhabit America and the adjacent islands. Their beak is long, straight or arcuate, tubular and very slender; their tongue is long, extensible and bifid, that is, divided into two filaments; their nostrils are covered by a wide arched membrane, and their feet, which are very short, have the tarsi shorter than the middle toe; their wings are very long; their plumage is sometimes ornamented with patches that are as brilliant as precious stones They feed on the nectar of flowers, about which they are seen buzzing and balancing in the air like certain flies, or rather butterflies. They sometimes eat small flies and other diminutive insects which they find in flowers. They live isolated, and defend their nests courageously, and sometimes contend fiercely with each other. The *Northern Humming-bird*,—*Trochilus colubris*,—is golden-green; the tail forked and dusky, and the three outer tail feathers are of a rusty white at tip. The male has a changeable ruby-coloured throat, which in the female is nearly white. This wonderfully diminutive and brilliant bird, is the only one of an American genus, of more than a hundred species, which ventures beyond the limits of tropical climates.

8. The *Hoopoes*,—*Upupa*,—have an ornament on the head formed of a double range of long feathers, which they can erect at will.

FAMILY OF SYNDACTYLÆ.

9. In the birds of this family, the external toe is almost as long as the middle one, to which it is joined by a membrane as far as the penultimate articulation.

10. The principal genera of this family, are: the Bee-eaters, the King Fishers, and the *Calaos*, or Hornbills, which may be readily distinguished from each other by the form of the beak.

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6. How do the *échelettes* differ from the Creepers properly so called?

7. How are Humming-birds characterised? What are their habits? Upon what do they feed? What are the characters of the Northern Humming-birds?

8. How are the Hoopoes distinguished?

9. How are birds of the family of Syndactylæ characterised?

10. What are the principal genera of this family?

In the Bee-eaters it is of moderate size, and slightly arcuate; in the Kingfishers, long and straight, and in the Hornbills of a disproportionate size, and surmounted by an enormous protuberance.

11. The *Bee-eaters*,—*Merops*,—have a moderate sized beak, which is trenchant, pointed, slightly curved, without a notch or tooth, and with an elevated edge; their nostrils are partly concealed by hairs directed forwards; the external toe is joined to the middle one as far as the second articulation, and the latter is joined to the external, as far as the first articulation. The *Common Bee-eater*,—*Merops apiaster*,—the only one found in Europe, has a fawn coloured back, a deep marine blue front and belly, and a yellow throat surrounded by black; it feeds on insects, particularly wasps and bees, which it seizes while on the wing. It constructs its nests in the precipitous banks of streams and large rivers, into which it digs to considerable depths.

12. The Kingfishers,—*Alcedo*,—(*Plate* 3, *fig.* 10.)—have a quadrangular beak, which is long, straight, pointed and trenchant; their nostrils are almost entirely closed by a naked membrane; their legs are short, and bare to above the knee. The only species found in Europe is the *Alcedo ispida*,—it is rather larger than a Sparrow, and is green, undulated with black above, with a stripe of deep marine blue along the back; reddish beneath, with a ribbon of the same colour on each side of the neck. The American species, the *Belted Kingfisher*,—*Alcedo alcyon*,—is crested, and of a bluish slate colour; it inhabits all the northern part of the American continent. His delight is to dwell amidst the most sequestered scenes, on the borders of rivers and streams, abounding in small fish and insects, upon which he feeds. By the broken or rocky bank of his aquatic retreat, he may be frequently seen perched on some dead and projecting branch, scrutinizing the waters for his expected prey; if unsuccessful, he courses along the stream, just above the surface, and occasionally hovers for an instant, with rapidly moving wings, over the spot where he perceives his gliding quarry; in the next instant, descending with a quick spiral sweep, he seizes a fish with which he rises to his post, and swallows in an instant. When startled from the perch, on which he spends many vacant hours digesting his prey, he utters commonly a loud, harsh, and grating

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11. What are the characters of the Bee-eaters? What are the characters of the Common Bee-eater? What are its habits?

12. What are the characters of the Kingfishers? How is the European Kingfisher characterised? In what respects does the Belted Kingfisher differ from the European species? What are its habits?

cry, very similar to the interrupted creakings of a watchman's rattle, and almost, as it were, the vocal counterpart to the watery tumult amidst which he usually resides. The nest is burrowed in some dry bank above the reach of inundation, to a depth of five or six feet. The female lays six or seven white eggs, and is assisted by the male in the incubation, which continues about sixteen days.

13. The *Calaos*, or *Hornbills*,—*Buceros*,—are large birds of India and Africa, remarkable for their enormous dentated beak, which is more or less arcuate, surmounted by a crest or prominence, often as large as the beak itself. (*Plate* 3. *fig*. 12.) These singular birds hunt mice, reptiles, small birds, and even attack dead bodies.

ORDER OF SCANSORIÆ OR ZYGODACTYLÆ.

14. In birds of this order the external toe is directed backwards like the thumb, which arrangement gives them a more solid support, and of which some genera take advantage in clinging to, and climbing the trunks of trees. (*Plate* 4, *fig*. 5, 6, 7, *and* 10.) It is from this circumstance they have obtained the common name of *Climbers*, although, strictly speaking, it is not applicable to all of them, as there are many birds that truly climb, which, owing to the disposition of their toes, do not belong to this group. Every bird that has two toes directed forward, and two backwards, belongs to the order of Scansoriæ, or Climbers. The habits of most of the species that belong to it are not known; and they vary in almost every genus.

15. The Climbers generally nest in the hollows of old trees; their powers of flight are middling; like the Passerinæ they feed on insects, or fruits according as their beak is more or less strong. It is remarked that in most of the genera that the sternum has two notches behind, which conformation is in accordance with the little strength of the muscles of their wings.

16. The principal genera may be distinguished by the following characters:

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13. What are Hornbills? Where are they found?

14. How are the Scansoriæ characterised? Do all climbing birds belong to the order of Scansoriæ?

15. Upon what do the Scansoriæ feed? Are they very powerful in their wings?

16. What are the principal genera of the order of Scansoriæ?

			(Genera.)
SCANSORIÆ, having the beak	Straight,	And angular; tongue very extensible, and armed with spines at the tip.	WOODPECKERS.
		And rounded; tongue very extensible, but without spines.	WRYNECKS.
	Arcuate,	Moderate, and slightly arcuate,	CUCKOOS.
		Large, rounded on all sides, and hooked,	PARROTS.
		Almost as long as the body,	TOUCANS.

17. The WOODPECKERS,—*Picus*,—are distinguished by their long, straight black beak, which is adapted for piercing the bark of trees; by their slender tongue, armed near the end with spines curved backwards, which can be extended considerably beyond the beak; (*Plate* 1, *fig.* 3.) and by their tail, which is composed of ten quills with stiff and elastic stalks, which serves them as a support when they climb trees. (*Plate*4, *fig.* 9.) All these birds are climbers, and have a family likeness to each other. They all have the habit of tapping and raising up the bark of trees to seize the insects which it conceals, and, after having struck on one side, of quickly running to the opposite, to seize the insects, which the noise may have caused to run away. It is erroneously believed that they can in this way pierce trees entirely through. Most Woodpeckers are marked with red, either on the head or body; almost all of them are streaked or speckled with brown on the ground colour of their plumage Their cry is sharp, and their flight heavy. They are lean, little esteemed, and inhabit all parts of the world, both within and without the equatorial regions, except New Holland. There are several species of Woodpeckers in the United States, the most common of which, are the *Flicker*, or *Golden Winged Woodpecker*,—*Picus auratus*,—and *Red-Headed Woodpecker*,—*Picus erythrocephalus*.

Birds resembling Woodpeckers are known, which have but three toes, two of which are directed forward, and one backwards.

18. The WRYNECKS,—*Yunx*,—(*Plate* 4, *fig.* 5.) have the protractile tongue of the Woodpeckers, but without the spines; their straight and pointed beak is nearly round, without any well marked angles, and is not sufficiently strong to penetrate and raise the bark of trees; like the Woodpeckers, they live on insects, but climb much less.

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17. How are Woodpeckers distinguished? What are their habits? Upon what do they feed?

18. What are the characters of the Wrynecks?

19. The *European Wryneck,—Yunx torquilla,*—is of the size of a lark; it is brown above, streaked in little blackish waves, and longitudinal meshes of fawn colour and black; beneath it is whitish with transverse blackish stripes. This bird, which is solitary in its habits, loves the mountain woods, and makes its appearance in France, in May, and departs again in September; without making a nest, it lays in holes in trees soon after its arrival. The Wryneck derives its name from a habit, which is peculiar to it, of twisting and turning the neck to one side, and behind, while the head is turned towards the back and the eyes half closed.

20. The CUCKOOS,—*Cuculus,*—have a moderate beak, well cleft, and slightly arcuate; the tarsi are short, and the tail long, composed of ten quills. (*Plate* 4, *fig*. 6.) They are birds of passage, and live on insects. The female makes no nest, and takes no care of her young; she deposites her eggs in the nests of other birds, most frequently in that of the *Fauvette.* The strange nurse, to whom the Cuckoo confides her eggs, becomes not only the best of mothers for the young progeny that does not belong to her, but to take care of them she neglects her own eggs, and only hatches a part of them. It is remarked that the young Cuckoos raise up the young ones of the Fauvette, and push them out of the nest, that they may not share the attentions of their common nurse. These birds remain in the nest more than three weeks after their birth, and for five weeks longer their adopted mother supplies them with food. The American species, on the contrary, are faithfully paired, and take care of their young. The *Yellow-billed Cuckoo,* or *Rain Crow,*—*Cuculus americanus,*—is dark grayish-brown, with bronzy reflections, and white beneath.

21. The TOUCANS,—*Ramphastos,*—(*Plate* 4, *fig*. 10.) are easily recognised by their enormous beak, which is almost as large and as long as the body; internally it is light and cellular, arcuate towards the end, and irregularly dentate on the edge; their nostrils, which are surrounded by a membrane, are concealed behind the horny mass that sheathes the front. Their tongue is long, narrow, and furnished on each side with barbs, like a feather. These singular animals inhabit only the hottest parts of America; they live in troops, and feed on fruits and insects.

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19. What are the characters of the European Wryneck? What are its habits? From what circumstance does it derive its name?

20. What are the characters of Cuckoos? What are the habits of the female? How does the American differ from the European species?

21. How are Toucans characterised? What are their habits?

They seek the nests of other birds, and devour their eggs, and their recently hatched young. When they obtain their prey, they do not attempt to grind it in their beak, because its structure prevents; but they toss it into the air, and, receiving it as it falls, swallow it whole.

22. The Parrots,—*Psittacus*,—(*Plate* 4, *fig.* 7. *and* 8) form a genus, numerous in species, which are found in all warm countries They have a large, hard, solid beak, which is rounded every where, and surrounded at its base by a membrane through which the nostrils are pierced; their tongue is thick, fleshy, and round; their feet are short and strong. They feed on fruits, and climb trees, assisting themselves with their feet and beak. They readily become familiar, and some species imitate the human voice very well; but their clamorous disposition renders them disagreeable in the house.

23. The plumage of Parrots varies in colour; it is generally remarkable for its clear and vivid tints: frequently, green predominates; while in certain species, on the contrary, red is the prevailing colour. From their intelligence, these birds seem to claim a place at the head of their class, and form the connecting link between it and the superior beings in the scale of animals. They learn to talk, retain airs, and are in short, susceptible of education; they convey their food to the beak with their claws; they are frugivorous, and also feed on buds, tender bark, roots, and sweet juices of plants. This genus is divided into Maccaws, Paroquets, Parrots properly so called, Cockatoos, &c.

24. The *Maccaws*,—*Ara*,—(*Plate* 4, *fig.* 7.) have a wedge-shaped tail, which is longer than the body, a strong beak and a naked face; they are all American. The *Ara aracari*, or *Blue Maccaw*,—is one that is most frequently seen in France, where it is produced in the domestic state; it is from thirty to thirty-two inches in length. All the upper parts, that is, the top of the head, the back of the neck, the back, the rump, the wings, and all the top of the tail are of a brilliant azure blue. The chest and all the under part of the body are of a bright yellow. The naked space on the cheeks is of considerable extent, and is of a rosy white colour, with three little horizontal lines of black feathers; the throat is surrounded by a broad greenish collar.

25. The *Paroquets*, also have a wedge-shaped tail, which is sometimes longer than the body, sometimes of the same length,

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22. How are Parrots distinguished? What are their habits?

23. What is the colour of the plumage of Parrots? For what are these birds particularly remarkable? How is the genus of Parrots divided?

24. How are Maccaws distinguished? What are the characters of the Blue Maccaw?

25. What are the characters of the Paroquets?

and sometimes shorter; they have a moderate beak, and the face is ordinarily feathered.

26. [The *Carolina Parrot,—Psittacus carolinensis,*—is green; the head and neck yellow; forehead and cheeks orange; tail elongated. Of the more than two hundred known species of this brilliant genus, it is the only one, found inhabiting the United States. It is rarely met with north of Virginia.]

27. The *Parrots properly so called,* have a short, square tail, a stout and strongly hooked beak, the face feathered, a large head, and a stout body. They all inhabit the torrid zone.

28. The *Gray Parrot,* or *Jaco,—Psittacus erythacus,*—is entirely ash-colour with a red tail. It is originally from Africa, and is much prized on account of its gentleness, its attachment to its master, and the facility with which it learns to speak.

29. The name of *Amazonian Parrots* is given to those that are very large, with a stout body and green plumage.

30. The *Cockatoos,* have the head ornamented with a tuft of feathers. (*Plate* 4, *fig.* 8.) The plumage of the greater number is white, and of all the various species, they are the most docile.

LESSON VI.

ORDER OF GALLINACEÆ.—*Zoological Characters.—Habits.—Hoccos.—Peacocks,* (*Common Peacock.*)—*Turkey.—Guinea-fowl.—Genus of Pheasants,* (*The Common Cock, Common Pheasant, Golden Pheasant.*)—*Genus of Grouse,* (*The Great Heath-cock, Partridge, Quail.—Genus of Pigeons.—Habits.—Carrier Pigeons.*

ORDER OF GALLINACEÆ.

1. The Order of Gallinaceæ comprises: Those terrestrial birds which have a short or moderate beak, vaulted above; the nostrils pierced through a membranous space, and covered by a cartilaginous scale, the body heavy, and the wings, in general, short.

2. These birds are essentially granivorous, and are provided with a very strong muscular gizzard; they delight in seeking their food on the ground amidst dust. Their sternum is weakened by two large notches which occupy its posterior part on each side; their inferior larynx is very simple, and not one of them sings agreeably.

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26. What is the Carolina Parrot?
27. How are Parrots properly so called, distinguished?
28. For what is the Gray Parrot esteemed?
29. What are Amazonian Parrots?
30. What are Cockatoos?
1. What birds are comprised in the Order of Gallinaceæ?
2. What are the general characters of the Gallinaceæ?

3. Most of our poultry belongs to this order; and no other affords man so many resources for his wants or his pleasures. The flesh of many of the Gallinaceæ supplies a light and wholesome meat which nourishes without overloading the stomach. Their feathers are applied to different purposes; they are employed as ornaments, and also in the useful arts. These birds are almost all from the warm countries of both continents.

4. This order is divided into two families, as follows:

5. *First.* The GALLINACEÆ PROPERLY SO CALLED, having the anterior toes united at their base by a short membrane, which is dentate on the edges; the tail is, generally, composed of fourteen or a greater number of quills.

6. *Second.* The PIGEONS, having the toes entirely divided, and the tail formed of twelve quills.

FAMILY OF GALLINACEÆ PROPERLY SO CALLED.

7. The Gallinaceæ properly so called, have a short, convex beak with the upper mandible arched or vaulted, and curved from its base to the point; their nostrils, which are pierced through a broad membranous space, are covered by a cartilaginous scale; their three front toes are united by a short membrane; the posterior toe articulates high on the tarsus, above the articulations of the anterior toes: sometimes, though rarely, the posterior toe is entirely wanting, or it is very small, and in many species, principally in the male, we remark on the posterior part of the tarsus, above the thumb, a process or projection called a *spur*, formed of a bony spine, covered externally with horn, more or less pointed, according to the species, and which increases in length as the animal advances in age. (*Plate* 4, *fig.* 11, *and Plate* 7, *fig.* 15.) The tarsi are short or of moderate length, and the feet are adapted for running or walking. These birds are very heavy; the body is fleshy, and the wings short, which, with the weakness of their pectoral muscles, renders their flight laborious. They are all *pulverators*, that is, they love to scratch the ground, and wallow in the dust; they generally feed on grains, sometimes on insects, and many species, on berries and buds. To swallow fluids when introduced into the beak, they elevate their head in the air. The females live in troops with a single male. Their nest is almost always made without art, upon the ground, and the male takes no part, either in its construction or in the

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3. To what uses are birds of this order applied?
4. How is this order divided?
5. What are the general characters of the Gallinaceæ properly so called?
6. What are the general characters of Pigeons?
7. How are the Gallinaceæ properly so called characterised? What are their habits?

incubation of the eggs, the number of which is generally considerable. So soon as the young ones escape from the shell, they walk, eat alone, and abandon the nest to follow their mother. They remain together forming a family until the following spring, when they separate. The sexes differ very much from each other in their plumage, at least, until they have attained an advanced age, when the female sometimes appears in the plumage of the male, which is more brilliant; they also differ in size, the female, in most species being smallest.

8. The principal genera composing this family may be recognised by the following characters:

Gallinaceæ properly so called, having a tail

- Which may be erected so as to form a circle; having the head
  - And the top of the neck covered by a red and warty skin. — **TURKEYS.**
  - Covered with feathers, and ornamented with a tuft, or crest. — **PEACOCKS.**
- Which cannot be erected so as to form a circle; and is
  - Large, rounded, and composed of twelve quills. — **HOCCOS.**
  - Composed of twelve quills.
    - Disposed like shingles; cheeks naked. — **PHEASANTS.**
    - Inclined, or Pendant.
      - Head naked, and the lower part of the cheeks furnished with fleshy wattles. — **PINTADOS.**
      - A strip of naked skin in place of eye-brows. — **GROUSE.**

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8. What are the principal genera of the Family of Gallinaceæ properly so called?

9. The *Hoccos,—Alector,*—are large gallinaceous birds of America, analogous to Turkeys, with a large round tail, composed of twelve large, stiff quills; their beak is thick, stout, compressed at the sides, surrounded at the base by a naked skin, which is sometimes gibbous; the tarsi are elongate and without spurs; they have four toes, three before and one behind, the latter resting a part of its length on the ground. These peaceful birds are easily tamed, and keep in great forests and on mountains. They seek their food on the ground, and perch upon the highest trees. Some nest on the large branches of trees, and others on the ground. Their nest is composed externally of dried branches and moss, and internally of leaves; they lay from two to eight eggs. In some parts of America Hoccos are reared as poultry. Their head is ornamented with a tuft of elevated feathers which are curled at the end.

10. Turkeys,—*Meleagris,*—have the head and top of the neck covered by a papillated skin which is destitute of feathers; under the throat, there is an appendage which hangs from the neck, and on the front, another conical appendage which lengthens and swells in the male during excitement. A pencil of stiff hairs or bristles hangs from the lower part of the neck of the male; the tail coverts, which are shorter and stiffer than in the Peacock, can be erected in the same manner, so as to form a circle; the males have feeble spurs. Turkeys, of which only two species are known, are originally from America, whence the Jesuit missionaries introduced them into Europe. The first Turkeys appeared in France in 1570, and were served at the wedding of Charles IX. They have been naturalised in all climates on account of the excellence of their flesh.

11. Peacocks,—*Pavo,*—have a moderate, conical, curved beak, which is naked at the base; the superior mandible is convex and vaulted; the head, which is covered with feathers, is ornamented with a crest; the tarsi are armed behind with a conical spur; but the most remarkable characteristic of these birds is, that the upper tail coverts in the male, are longer than the quills, and may be elevated when he spreads his tail. The *Common Peacock,—Pavo cristatus,*—has the head crowned with a crest of twenty-four straight feathers, and the feathers of the rump, which have a floating or loose beard, are of unequal size, being shorter in

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9. What are the characters of Hoccos? What are their habits?

10. How are Turkeys characterised? To what part of the world are they indigenous? When were Turkeys first used in France?

11. How are Peacocks characterised? What are the characters of the Common Peacock? Are they found wild in any part of the world?

proportion as they are superior, and each one is terminated by numerous brilliant metallic circles; the female is destitute of this ornament, the richness and beauty of which, known throughout the world, are beyond description, particularly when the bird spreads its tail. The Peacock is still widely diffused in the wild state, in the north of India, and in most parts of the Indian archipelago.

12. The Pintados, or Guinea-Fowls,—*Numida*,—(*Plate* 5, *fig.* 1.) have a naked head with fleshy wattles on the lower part of the cheeks, and the cranium is generally surmounted by a callous crest; their feet are without spurs; their tail is short and pendent; and the feathers of the rump give the body a rounded form.

13. All the Pintados are originally from Africa; they live in numerous troops under bushes, and in copses, where they seek berries and small snails on which they feed. The European species have been transported to the New World, where, in many places, they have become naturalised in the wild state.

14. Pheasants,—*Phasianus*,—(*Plate* 4, *fig.* 11.) are naked around the eyes, and the cheeks are covered by a red skin, or by very short feathers; they have no crest, and the lower mandible is without wattles; the tail quills, eighteen in number in most of the species, are placed on each other in two layers like shingles on the roof of a house, or in other words, the tail is tectiform, and maintained in a horizontal position.

This genus is divided into many sub-genera, among which we will cite the Cocks, and Pheasants properly so called.

15. The *Cocks*,—*Gallus*,—have a beak naked at the base, furnished with two pendent and compressed caruncles; the head is surmounted by a fleshy crest, or a bundle of feathers; the tarsi are armed with long, curved spurs, and only the end of the thumb rests on the ground; the wings are short; the quills of the tail, fourteen in number, form two vertical planes, placed back to back; in the male the coverts of the latter are prolonged into an arch over the tail proper.

16. The *Common Cock*,—*Phasianus gallus*,—the female of which is called a *Hen*, is originally from India; it is still met with wild, in the mountains of Hindoostan, but in the domestic

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12. How are Guinea-fowls characterised?
13. To what country did the Pintados originally belong? What are their habits?
14. What are the characters of Pheasants?
15. How are the Cocks characterised?
16. To what country does the Common Cock belong?

state, it is spread throughout the world. There exists a great number of varieties of it.

17. The *Pheasants properly so called*, have a long, cuneiform tail, each of the quills of which being inclined on two planes, cover each other like the shingles of a roof. To this group belongs the *Common Pheasant* of Europe, which is also originally from Asia, and which is also remarkable for the beauty of its plumage. In the male, the top of the head and the upper part of the neck are of a silver gray, which, in the reflections of light, seems to change to blue. The feathers of the chest, of the shoulders, of the middle of the back, as well as those of the sides beneath the wings, have a blackish ground with purple edges on transverse lines of gold colour; the plumage of the female is not so beautiful as that of the male: the iris is yellow and the eyes are placed between two parts which are of a scarlet colour. It is said, that the Pheasant was originally introduced into Europe by the Argonauts from the banks of the river Phasis in Asia Minor.

18. The *Golden Pheasant*, — *Phasianus pictus*, — (*Plate* 4. *fig*. 11.) comes from China. It is one of the most beautiful birds known; the belly is of a bright red; a tuft of golden yellow reclines from the top of the head; the neck is surrounded by a magnificent orange collar, sprinkled with black; the upper part of the back is green, and the lower part, as well as the rump, is yellow; the wings are bright red with a beautiful spot of blue; the tail, which is very long, is brown, spotted with gray.

19. The *Argus*, — *Phasianus argus*, — comes from the south of Asia. The head and neck are nearly naked; the tarsi are without spurs, and the secondary feathers of the wings are covered with eye-like spots, which, when the wings are spread, give the bird a remarkable appearance.

20. No true Pheasant has yet been discovered in America.

21. The *Grouse*, — *Tetrao*, — are recognised by a naked and, ordinarily, red strip, that occupies the place of the eye-brow. They are very numerous and are divided into many sub-genera, the principal of which are the following:

22. 1st. The *Heath-Cocks*, have the tarsi covered with feathers and without spurs, the toes naked, and the tail round or forked:

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17. How are Pheasants properly so called, characterised? From what part of the world is the true Pheasant derived?

18. What are the characters of the Golden Pheasant?

19. How is the Argus recognised?

20. Is there any true Pheasant in America?

21. How is the genus of Grouse recognised? What are the principal sub-genera?

22. How may the Heath-cocks be known?

23. 2nd. The ***Ptarmigans***, or ***White Grouse***, which have the toes feathered as well as the legs;

24. 3d. The *Partridges*, the tarsi of which are naked like the toes, and armed, only in the male, with short spurs, or simple tubercles;

25. 4th. The ***Quails***, which also have naked tarsi without spurs, and in which, the eye-brow is not red.

26. The ***Heath-Cocks***,—***Tetrao***,—are for the most part birds of large size; there is one species in France which is larger than the Turkey, and even larger than any other gallinaceous bird. The *Great Heath-cock*,—*Tetrao urogallus*,—(*Plate* 5, *fig.* 3.) The plumage of the male is slate colour, finely and transversely striped with black; the female, which is a third smaller, is fawn colour, with transverse, black or brown lines. The young resemble the female up to the first moulting. This bird is found in considerable numbers in Russia, Siberia, and generally in all the northern parts of Europe and Asia; and is more rare in Germany, Hungary, and France. It always lives in the same place, inhabiting through preference, mountain forests, and feeds chiefly on berries, buds, young shoots, grains, insects and worms. Its flesh is delicious.

27. [The ***Ruffed Grouse***,—***Tetrao umbellus***,—is mottled; the tail is gray or ferruginous, speckled or barred with black; the male has a ruff of broad black feathers on the sides of the neck; in the female the ruff is smaller and dusky brown. It is known by the name of *Pheasant*, in the Middle and Western States, and by that of *Partridge* in New England. It inhabits the American continent from Hudson's Bay to Georgia, but is most abundant in the northern and middle parts of the United States. It feeds chiefly on berries.

28. The ***Pinnated Grouse***,—***Tetrao cupido***,—is partly crested and mottled; and the tail is rather short and much rounded. The ***Grouse***, or ***Prairie-Hen***, is confined to dry, barren, and bushy tracts of small extent, and in several places it is now nearly or wholly exterminated. It is still met with on the Grouse Planes of New Jersey, on the Bushy Planes of Long Island, in

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23. What are the generic characters of the Ptarmigans?

24. How are the Partridges recognised?

25. How are the Quails recognised?

26. What are the general characters of Heath-cocks? What are the characters of the Great Heath-Cock? Where is it found? What are its habits? Upon what does it feed?

27. What are the characters of the Ruffed Grouse? Where is it found? By what other names is it known?

28. Where is the Prairie-Hen found?

similar shrubby barrens in Connecticut, and in the Island of Martha's Vineyard, on the south side of Massachusetts Bay.]

29. The *Ptarmigans*, or *White Grouse*,—*Lagopus*,—have a round or square tail, and often become white in winter. [The Ptarmigan,—*Tetrao lagopus*,—constantly resides in the coldest arctic deserts, and in the lofty mountains of Central Europe, where, as the snow begins to melt away, it seeks out its frozen bed, by ascending to the limits of eternal ice. It is common to the extreme northern regions of both the old and new continent. It feeds on many kinds of berries, heath, young shoots of pine, and occasionally eats a few insects. To protect themselves against the entreme cold of the climate, Ptarmigans dwell in the snow. As soon as they leave their frozen retreats in the morning, they fly vigorously upward into the air, shaking the snow from their warm and white clothing. They are much esteemed as food in every country where they occur, and are commonly taken in nets. Between the months of April and May, it is said, that as many as ten thousand are taken for the use of the Hudson's Bay settlement; and in Europe, during the winter, they are carried in thousands to the markets of Norway.]

30. *Partridges* live in pairs, and keep on the ground. Two species of Partridge are common in France: the gray and the red. The *Gray Partridge*,—*Tetrao cinereus*,—keeps in the fields; it is ashy brown elegantly mingled with black; the tail is short and the legs are of a greenish white; the beak and feet are ash-colour. In young Partridges there is observed, between eye and ear, a naked skin which is of a brilliant scarlet. The male has on the breast a chestnut coloured spot in the form of a horse shoe. The female is distinguished by less brilliant and less marked colours. She lays from twelve to eighteen eggs, and makes a nest on the ground of dry leaves and moss. The young ones run the moment they escape from the shell, a part of which they frequently drag after them. It not unfrequently happens that they place the eggs of a Partridge under a hen, who sits upon, and takes care of them as if they were her own.

31. The *Red Partridge*,—*Tetrao rufus*.—has the beak and feet red; it prefers to keep on hills and elevated places; its flesh is whiter than that of the gray Partridge.

32. [*American Partridges*,—*Ortyx*,—have the beak short, thick, higher than it is wide; the upper mandible curved from the

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29. What are the habits of the Ptarmigan? Where is it found?
30. What are the characters of the Gray Partridge of Europe?
31. How is the Red Partridge distinguished?
32. What are the characters of American Partridges?

base; no naked space around the eye; the nostrils half closed by a membrane. The tarsus is destitute of spur or tubercle.

33. These birds alight on low trees or bushes, sometimes roosting in them; they also dwell on the ground, both by night and day. They are usually monogamous, the male taking charge of, and protecting the young, which associate with the old until the time of pairing. These are peculiar to America.

34. The *American Partridge,* or *Quail,—Ortyx virginiana,*—is without a crest; the plumage cinnamon brown, varied with black and whitish; throat white, bounded with a black crescent; beak black; the feet ash-colour. Though the Partridges of America are exceedingly prolific, they have been so thinned in some parts of the country, that sportsmen, acquainted with their local attachments, have been known to introduce them into places for breeding, to prevent their threatened extermination.]

35. The *Quails.—Coturnix,*—are smaller than Partridges, and have a shorter tail. The *Common Quail* of Europe,—*Tetrao coturnix,*—has a brown back, waved with black and dotted with white, a brown throat, and a whitish eye-brow. The female makes a nest like the partridge; she lays six or seven eggs which are of a gray colour with brown spots. They are hatched at the end of about three weeks.

36. Quails are birds of passage, and celebrated for their migrations; they are found throughout Europe, and in most parts of the United States. In the autumn, they pass in immense troops from Europe, across the Mediterranean to the coast of Africa; they return in the spring, and at that time they rest on some one of the Islands of the archipelago.

FAMILY OF PIGEONS.

37. The PIGEONS,—*Columba,*—are regarded as forming the natural link or transition between the Passerinæ and Gallinaceæ.

38. Pigeons have a moderate, compressed, straight, vaulted beak, which is curved at the point, (*Plate* 5, *fig*. 4.;) their nostrils are in the middle of the beak, pierced through a soft skin and covered by a cartilaginous scale which is inflated or bulged at the base of the beak; their feet are frequently red; they have three toes in front, which are entirely separate, and a posterior

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33. What are their habits?

34. What are the characters of the American Partridge or Quail? Whether is it migratory or sedentary in its habits?

35. What are the characters of the common European Quail?

36. What are the habits of Quails?

37. What relation do Pigeons bear to the Passerinæ and Gallinaceæ?

38. What are the characters of Pigeons? What are their habits?

toe which is articulated upon the same plane as the others. They fly well, and differ very much from the *Common Gallinaceæ* in their habits. When they drink, they do not elevate the head as the latter do, and they ordinarily perch on trees. These birds always live in a state of monogamy, and the male never leaves his female companion. They evince great mutual tenderness and express it by frequently caressing each other, and by the accents of their voice, the modulation and tone of which have been designated by the term *cooing*. Both unite in the construction of the nest, and place it, according to the species, sometimes on the tops of the highest trees, amongst bushes, or even on the ground, and other times in the cavities of rocks. This nest, coarsely constructed of small branches and leaves, is very open, and ordinarily receives only two eggs, upon which the male and female alternately sit. One of these two eggs usually gives birth to a male, and the other to a female: and these two individuals being reared together remain forever after paired. They feed their young by disgorging into their little throats, grains macerated in their own stomach, and which they cause to regurgitate into the beak by a kind of contraction.

39. These birds form but a single genus; among the wild species in Europe are the Cushat, the Rock Dove, and the Turtle Dove.

40. Pigeons are reared in vast numbers in the domestic state; one of the most celebrated races is the *Carrier Pigeon*, which is distinguished from all others, by a broad naked band which surrounds the eye, and its deep black plumage; it is remarkable for its rapid flight, and for the singular faculty it possesses of again finding the place where it was born, or where it left its young, after having been carried to very great distances. It has been often employed to convey letters, and it has been known to make a journey of upwards of a hundred leagues in a few hours.

41. [Among the American species, the most remarkable is the *Passenger Pigeon,—Columba migratoria,*—which is bluish gray, with a white belly and black tail. The wild Pigeon of America, it is estimated, can fly several hundred miles at the rate of a mile a minute. The whole species seems to be always congregated in one huge flock, composed of millions of individuals; and they remain in one locality for several years, and then leave it from dearth of food, which appears to be the sole cause that determines their migrations. They feed on acorns and berries.]

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39. What number of genera constitutes the family of Pigeons?

40. What are the characters of the Carrier Pigeon? How is it employed?

41. What are the characters of the Passenger Pigeon? What are its habits?

LESSON VII.

ORDER OF GRALLATORIÆ.—*Zoological Characters.*—*Habits.*—*Division into eight Families.*

FAMILY OF BREVIPPENNES.—*Ostrich.*—*Organization.*—*Habits.*—*Cassowaries.*

FAMILY OF PRESSIROSTRES.—*Bustards.*—*Plovers.*—*Lapwings.*

FAMILY OF CULTRIROSTRES.—*Cranes,* (*Common Crane*)—*Herons,* (*Common Heron.*)—*Storks,* (*Common Stork.*)—*Spoonbills.*

FAMILY OF LONGIROSTRES.—*Genus of Curlews.*—*Ibis,* (*Sacred Ibis.*)—*Snipe,* (*Woodcock, Common Snipe.*)—*The Avosets.*

FAMILY OF MACRODACTYLI.—*Rails.*— *Water-Hens.*

FAMILY OF FLAMINGOS.—*Common Flamingo* —*Habits.*

ORDER OF GRALLATORIÆ.

1. The Order of Grallatoriæ is composed of birds that have the lower part of the leg naked like the tarsus, (*Plate* 5, *fig.* 5, *to* 11.) Almost all these birds are remarkable for the length of their legs, and appear as if they were mounted on stilts. Their feet, most generally, have a small palmate membrane betwixt the external toes, and they sometimes are without a thumb. Their form is ordinarily lank, and their neck is very long; their beak varies in its shape, but is also, in general, very long.

2. Most of the Grallatoriæ, which are also called Waders, or beach birds, frequent watery places, and wade in shallow waters to seek their food; with some exceptions, they all feed on animal substances, and seek fishes, reptiles, or worms and insects, according as their beak is strong or weak; a small number of them feed on grains and herbage, and these only live remote from water. And almost all these birds have very long wings; they fly well, and extend their legs behind them when they fly, whereas, other birds, on the contrary, fold them under the belly.

3. The Grallatoriæ, which build their nests on trees, and in elevated situations, are monogamous, and feed their young until they are able to fly: almost all those that build on the ground are polygamous, and their young seek their own food soon after birth.

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1. What are the general characters of those birds that belong to the order of Grallatoriæ?

2. What are the general habits of the Grallatoriæ or Waders? Upon what do they feed?

3. In what respect do the monogamous differ from the polygamous Grallatoriæ?

4. This order is composed of five principal families, and three small isolated groups, which differ too much from the other Grallatoriæ, to be comprised in the preceding divisions, and may, therefore, be considered as forming so many separate families.

5. The five principal families, which are characterised according to the form of the beak, are the Brevipennes, the Pressirostres, the Cultrirostres, the Longirostres, and the Macrodactyli.

6. The three accessory families, each one of which is formed of a single genus, are the Sheath-bills, or Vaginals, the Glarioles, and Flamingos.

These different groups may be distinguished by the following characters:

GRALLATORIÆ, having wings (Families.)

- Too short for flight, ... BREVIPENNES.
- Sufficiently long for flight. Toes
  - Moderate; beak
    - Moderate, but strong, (thumb wanting, or too short to rest on the ground.) PRESSIROSTRES.
    - Large, and conical, . . . VAGINALS, and GLARIOLES.
    - Long,
      - Large, strong, and ordinarily pointed and trenchant. LONGIROSTRES.
      - Slender and flexible, CULTRIROSTRES.
      - Bent, ... FLAMINGOS.
  - Extremely long, and sometimes widened by membranes. MACRODACTYLI.

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4. Into how many families is the order of Grallatoriæ divided?
5. What are the principal families?
6. What are the accessory families?

FAMILY OF BREVIPPENNES.

7. The Brevipennes (*Plate* 5, *fig.* 5.) are very large birds that are entirely incapable of flying, and have rudimentary wings only; but they are remarkable for the strength of their posterior extremities, which renders them excellent runners. Here, the muscles of the chest not being required, as is the case in other birds to make the strong efforts necessary to depress the wings during flight, are very small, and there is no projecting keel in the middle of the sternum for their attachment, as in other birds; this bone is in the form of a simple shield. It is to be observed also, that all the Brevipennes want the thumb, and that, both in the form of their beak and in their regimen, they are very analogous to the Gallinaceæ. This family is composed of two genera: the Ostriches and the Cassowaries. The first have broad, flexible feathers, and the second are covered with narrow, stiff plumes, almost like bristles.

8. Ostriches,—*Struthio*,—(*Plate* 5. *fig*. 5.) are very large birds with long legs and tarsi, a long slender neck, and a very small head; they have only rudimentary wings, composed of loose, flexible feathers with isolated barbs, which are entirely unsuitable for flight, but which these animals make use of in running. The beak, which is of moderate length, is soft at the end; the eye is large and the lids are fringed with eye-lashes; the tongue is short and rounded like a crescent; the crop is enormous, the gizzard very strong, and the intestines voluminous; and above the cloaca their is a sort of large reservoir in which the urine accumulates as in a bladder; and this is the only bird that urinates.

9. Two species of Ostriches are known: one, proper to the eastern continent, and characterised by having only two toes; the other, proper to America, which is recognisable by having three toes.

10. The *Ostrich of the Eastern Continent*,—*Struthio camelus*,—(*Plate* 5, *fig*. 5.) is the largest of birds; it attains six or seven feet in height and weighs as much as eighty pounds; the head and neck are thinly covered with feathers; the back, breast and belly are covered with black mingled with white and gray feathers, and those of the wings and tail are white; the thighs are almost as naked as the neck, and of the two toes which termi-

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7. What are the characters of the Brevipennes?

8. What are the characters of Ostriches?

9. How many species of Ostriches are known? How are they distinguished?

10. What are the characters of the Ostrich of the eastern continent?

nate the foot, the external one is but half the length of the other, and without a nail.

11. This bird lives in numerous troops on the sandy deserts of Africa and Arabia; it is essentially herbivorous, but it is so voracious that it indiscriminately devours everything that falls within its reach until its stomach is filled; it even swallows stones, fragments of metal, pieces of wood, and animal as well as the vegetable substances upon which it feeds; the strength of its stomach is enormous. It can run more rapidly than the fleetest horse. The strength of this animal is astonishing; an Ostrich with two men on its back has been known to run faster than an excellent English courser.

12. The eggs of the Ostrich weigh nearly three pounds each; in those countries which are not very warm, the female, and even the male sits upon them; but on the burning deserts near the equator, they leave them in the sand, exposed to the heat of the sun. The period of incubation seems to be about six weeks, and the young are feathered when born and able to run at once.

13. The broad flexible feathers of the wings and tail of the African Ostrich are much prized as ornaments.

14. The *American*, or *Three-toed Ostrich*,—*Struthio rhea*,—is more than one half smaller than that of the eastern continent; its plumage is grayish, and the feathers are scarcely of any value. It abounds in Buenos Ayres.

15. The CASSOWARIES,—*Casuarius*,—are recognised at first sight by the feathers, the barbs of which being so lightly fringed that at a distance they resemble pendent hairs; their wings are even shorter than those of the Ostrich, and are totally useless even in running.

16 Two species are known, namely; the *Emeu*, or crested Cassowary, and the Cassowary of New Holland.

17. The *Emeu*, or *Crested Cassowary*,—*Struthio casuarius*,—is almost as large as the Ostrich of the eastern continent, but not so tall; it is remarkable on account of the azure blue and red skin that covers the head and part of the neck; for its pendent caruncles like those of a Turkey, and for a sort of helmet or crest, formed by a bony prominence, covered with horn, which

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11. What are the habits of the Ostrich of the old world?
12. What is the size of the eggs of the Ostrich?
13. The feathers of what part of the Ostrich are used for ornament?
14. How does the American Ostrich differ from the Ostrich of the old world?
15. How are the Cassowaries recognised?
16. What species of Cassowary are known?
17. What are the characters of the Emeu?

surmounts the head. The feathers of the body are black, and for the most part double. It runs almost as rapidly as the Ostrich. It inhabits the Indian archipelago.

18. The *Cassowary of New Holland,—Casuarius Novæ Hollandiæ,*—is of a brownish gray, and almost the whole head as well as the neck, is covered with fringed feathers. Its speed is greater than that of the preceding species. Its flesh resembles beef.

FAMILY OF PRESSIROSTRES. [illegible]

19. The Pressirostres, like the Brevipennes, and many of the Longirostres, are high on their legs, and without a thumb, or the thumb is too short to touch the ground; their beak is of moderate length and sufficiently strong to dig the earth in search of worms; their wings are sometimes short, but can always be used in flight. (*Plate 5, fig.* 6, *and* 7.)

20. This family is composed of the Bustards, the Plovers, the Lapwings, and some other genera, the characters of which are as follows:

				(Genera.)
PRESSIROSTRES, having the wings	Very short,			BUSTARDS.
	Pretty long; beak	Moderate.	Without a thumb	PLOVERS.
			With a thumb,	LAPWINGS.
		Strong and pointed,		OYSTER-CATCHERS.

21. The BUSTARDS,—*Otis,*—are large, heavy birds that resemble the Gallinaceæ in the massive form of their bodies, and in having the upper mandible slightly vaulted. Their wings are short, and they fly but little; most commonly like the Ostriches, they employ them only to accelerate their speed when running. Their food consists of grains, herbs, worms and insects.

Two species are found in Europe, namely; the great Bustard, and the Little Bustard.

22. The *Great Bustard,—Otis tarda,*—which is of a bright fawn colour, crossed with numerous black streaks on the back, and grayish on the rest of the body, attains to more than three feet in length; the male is the largest of European birds; the female is about one third smaller. It is a timid bird, and keeps

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18. How is the Cassowary of New Holland characterised?
19, How are the Pressirostres characterised?
20. What genera compose this family?
21. What are the characters of Bustards? Upon what do they feed?
22. What are the characters of the Great Bustard? What are its habits?

on naked and extended planes; it flies little, but runs with great rapidity. It nests in fields of grain, and often unites in bands of from fifty to sixty individuals.

23. The *Little Bustard,—Otis tetrax,*—is more than one half smaller than the preceding; it is brown, dotted with black above, and whitish beneath. It is less frequently met with than the Great Bustard.

24. The PLOVERS,—*Charadrius,*—(*Plate* 5, *fig.* 6.) like the preceding, have no thumb; but their moderate beak is compressed and swelled at the end; their wings are moderate, and they fly well. They habitually frequent sea-coasts, the mouths of rivers, maritime marshes, and feed chiefly on worms, which they induce to crawl out of the ground by striking their feet upon it. Some species live solitary, and others in small troops. They emigrate every year, in more or less numerous troops, and it is chiefly in the autumn during the rains, that they are seen in greatest numbers; from this circumstance they have obtained their name. When on land, they are in constant motion, and they fly in a long file. Their flesh is delicate and esteemed: in those provinces where they are common, many are taken by means of nets. The species of France are seen only in autumn and spring; they are the Dotterel, the *Golden Plover*, and the *Ring Plover;* they are all found in the United States. There are several species which have a horny spur on the carpal end of the forearm.

25. The LAPWINGS,—*Vanellus,*—differ from Plovers in having a thumb, but it is so small that it does not touch the ground. Their habits are the same, and they often go in company with them.

26. The CRESTED LAPWING, — *Vanellus cristatus,* — inhabits Europe; it is a pretty bird of the size of a Pigeon, bronze black with a long and slender crest, (*Plate* 5, *fig.* 7.) It arrives in France in the spring, builds its nest in the fields, and remains through the summer; but most of the species very soon after their arrival, continue their course to the north, and return in the autumn.

27. [The OYSTER-CATCHERS,—*Hæmatopus,*—have a somewhat longer beak than the Plovers or Lapwings. They dwell exclusively along the borders of the sea, frequenting beaches and

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23. What are the characters of the Little Bustard?

24. What are the characters of the Plovers? From what circumstance do they derive their name? What are their habits?

25. How do Lapwings differ from Plovers?

26. What is the Crested Lapwing?

27. How are the Oyster-catchers characterised? What are their habits?

sandy shores, where they are seen to follow the waves in search of marine insects. The *Oyster-Catcher,—Hæmatopus ostralegus,*—is common to the north of both continents, and is frequent on the sea shore of New Jersey and the Southern States.

FAMILY OF CULTRIROSTRES.

28. All the Grallatoriæ of this family have a long, thick, strong beak, which is frequently trenchant and pointed; in general, they have a well marked thumb.

29. It may be divided into three tribes, namely:

1st. The Cranes, which have a straight beak, slightly cleft, and nearly one half of it is occupied by the membranous fossæ of the nostrils.

2nd. The Herons, whose beak is strong, cleft to beneath the eyes, and grooved.

3d. The Storks, whose beak is very long, and very strong.

30. The Cranes,—*Grus*,—have a straight beak which is but slightly cleft; the toes are moderate, the external ones being a little palmate, and the thumb scarcely touches the ground. Almost all of them have the head and neck, to a greater or less extent, destitute of feathers; their habits are more terrestrial than those of the other Cultrirostres, and their food is more vegetable.

31. The *Trumpeters*,—*Psophia*,—and *Cranes* properly so called, are ranged under this division. Among the former are the *Crowned Crane*, which comes from the western coast of Africa, and the Numidian Crane; and amongst the latter is the Common Crane, which is more than four feet high; and which is celebrated for the migrations it makes every autumn from north to south, and every spring in a contrary direction, in numerous and well conducted troops.

32. [The *Whooping Crane,*—*Grus americana,*—is white; primaries black, and with black shafts; the whole crown and cheeks bald. This stately Crane, the largest of all the feathered tribes in the United States, is met with in almost every part of North America, dwelling amidst marshes, and dark and desolate swamps; it retires to the West Indies to pass the winter, though some have been known to linger, through the whole of the inclement season, in the swamps of New Jersey, near Cape May.]

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28. How are the Cultrirostres characterised?
29. Into what tribes is the family of Cultrirostres divided?
30. How are Cranes characterised?
31. For what is the common Crane celebrated?
32. What are the characters of the Whooping Crane?

33. The HERONS,—*Ardea,*—are more carnivorous, and are recognised by their larger toes, and by their strong beak which is cleft to beneath the eyes, and acuminated. They are gloomy birds, and build their nests in swamps, along the banks of rivers. They feed on fish, frogs, moles, insects, &c.

34. The tribe is divided into Herons properly so called, Boat-bills (*Cancroma*) &c. The beak in the first is higher than it is wide, and in the second flattened and very broad.

35. HERONS PROPERLY SO CALLED,—*Ardea,*—have the eyes surrounded by a naked membrane, which extends to the beak; the tarsi are scutellated, &c.

36. The *Common Heron,*—*Ardea cinerea,*—is a large bird, the plumage of which is bluish ash-colour, with the front of the neck white, sprinkled with black tears, and a black tuft on the occiput; it is almost always solitary, and is often seen for hours together, on the same spot, standing motionless on one foot, the body almost straight, the neck bent, and the beak resting on one shoulder; it is gloomy and timid, and, in general, flies during the night, when it utters a harsh, sharp cry; its flight is not rapid, but very powerful, and it can soar to an immense height. Its depredations on the fishes of European rivers, render it highly prejudicial; it is celebrated on account of the sport which the wealthy in former times, derived from hunting it with falcons.

37. The *Crab-eater*, is a species of Heron of small size which is found in the mountainous districts of France; it frequents the vicinity of ponds.

38. The name of *Egrets* is given to certain Herons, the feathers of which, on the lower part of the back, at a certain period, are long and fringed; the most beautiful species, the feathers of which are used for ornamental purposes, are the Great and the Little Egret; their plumage is entirely white, and they are met with in Europe.

39. The *Bitterns*, and *Night-Herons*, also belong to this tribe.

40. The tribe of STORKS is characterised by a larger and smoother beak than the preceding, and by strong, almost equal palmate membranes betwixt the bases of the toes.

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33. What are the characters of Herons?
34. How is the tribe of Herons divided?
35. How are Herons properly so called, characterised?
36. What are the characters of the Common Heron? **What are its habits?**
37. What is the Crab-eater?
38. What are Egrets?
39. What are Bitterns?
40. How is the tribe of Stoıks characterised?

41. The *Storks properly so called,—Ciconia,*—have a large beak which is moderately cleft; their light and broad mandibles, by striking against each other, produce a peculiar clash. Their legs are reticulated and not very muscular. Their movements are slow, and their steps long and measured; in their powerful and sustained flight, they carry their head stiffly in advance, and their legs, extended behind, serve them for a rudder.

42. The *White Stork,—Ardea ciconia,*—(*Plate* 5, *fig.* 8.) appears in France and Germany in the spring, and passes the winter in Africa. It is a large, white bird, with the primaries of the wings black, and the beak and feet red. They live in pairs, and return every year to lay in the same nest. There is no bird which has received, from different nations, more universal protection than this, which is, in fact, every where useful in ridding the soil of prejudicial animals, without, at the same time, doing the smallest injury. Among the ancients, this veneration was carried to such an extent, that it was made a crime to kill one of these birds; in Thessaly it was even punishable by death. Like the Ibis, the Stork was an object of worship amongst the Egyptians; and its instinctive qualities have no doubt contributed to increase this respect which is perpetuated among the orientals, and still observed in Switzerland and Holland. It has so much affection for its young that it does not quit them in the greatest danger; it is recorded in history, that the Stork of Delft, which was uselessly urged to carry away her young, remained and perished with them in the conflagration of that city. The tender attentions which these birds pay to their parents in old age, are not less remarkable, and it is for this reason that the Greeks gave their name to the law which obliges children to furnish aliment to their parents when they are in want.

43. Some species of Storks have on the middle of the neck an appendage which resembles a large sausage, on account of which they are called, *Pouched Storks;* the feathers from beneath their wings form those light plumes which are called, by the French, *Marabous;* one species is found in Senegal, and another in India.

44. The *Spoonbills,—Platalea,*—resemble the Storks in their whole structure; but their beak, from which they derive their name, is flat, and widened at the end into a round disk like a spatula, (*Plate* 5, *fig.* 9.) This conformation permits them to

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41. What are the characters of Storks properly so called?

42. What is the White Stork? What are its habits? For what is it remarkable?

43. What are Pouched Storks?

44. What are the characters of the Spoonbills?

feed only on little animals which they obtain, either by rooting in the mud, or fishing in the water. One species is spread throughout the eastern continent, and another is proper to South America.

FAMILY OF LONGIROSTRES.

45. The Longirostres have a long, slender and feeble beak, which is only suitable for rooting in the mud, in search of worms and small insects, (*Plate* 5, *fig*. 10.) These Grallatoriæ form two tribes, Snipes in which the beak is straight, or curved downwards; and the Avosets in which the beak is curved upwards.

46. The first of these groups is composed of the Ibis and Curlews, in which the beak is arcuate, and Snipes properly so called, Sandpipers, the Ruffs, and a great number of other birds in which the beak is straight.

47. The Ibises, (*Plate* 5, *fig*. 10.) have the beak arcuate, a part of the head, and even a part of the neck, destitute of feathers, the external toes perceptibly palmate, and the thumb sufficiently long to rest on the ground.

48. ["Species of the Ibis inhabit all quarters of the world. They frequent the borders of rivers and lakes, where they are accustomed to feed on insects, crustacea, worms and shell fish, to which they also, at times, add vegetables. But we may place among popular fables, the reputation they have long enjoyed, of being the great destroyers of serpents and venomous reptiles, which in fact, they never touch. They migrate periodically to such distances, that the boundaries of the earth alone seem to set limits to their wanderings."]—*Nuttall.*

49. A species of this genus, the *Sacred Ibis,*—*Ibis religiosa,*—is celebrated on account of the religious worship it received among the Ancient Egygtians; it was reared in the temples of that country, and embalmed after its death. According to some, these honours were rendered to the Ibis because it devoured serpents which might have become dangerous to the country, and according to others, because its appearance announced the rise of the Nile. It is often seen sculptured on the monuments of that remarkable people. It is a bird of about the size of a hen; the plumage is white, except the ends of the primaries of the

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45. How are the Longirostres characterised? How is this family divided?
46. What birds compose the tribe of Snipes?
47. What are the characters of the Ibises?
48. Where are Ibises found? Upon what do they feed?
49. What is the Sacred Ibis? Why is it called sacred? What are its characters?

wings, which are black, and the beak, and the feet, as well as the naked portion of the head and neck, which are also black. This species is found throughout Africa.

50. The *Curlews,—Numenius,*—have the beak arcuated like that of the Ibis, but it is more slender and round throughout; the tip of the upper mandible extends beyond the end of the lower one, and projects a little downwards in front of it. The toes are palmated at base. They are met with on our own coasts.

51. The SNIPES PROPERLY SO CALLED,—*Scolopax,*—have a straight beak, a compressed head, with large eyes, placed far back, and the feet are not palmated; they are singularly stupid in appearance, which is not contradicted by their habits.

52. The *Common Woodcock* of Europe,—*Scolopax rusticola,*—inhabits lofty mountains during the summer, and descends into the woods about the middle of October; it goes alone or in pairs, particularly in bad weather, and seeks worms and insects in the soil.

53. [The *American Woodcock,—Scolopax minor,*—differs from the European species, in the temperature of the climates selected for its residence. It is met with, in summer, between the river St. Lawrence and the limits of the Middle States, and in the winter retires to, or beyond the boundary of the Union. It revisits Pennsylvania early in March. The sensibility of the end of the beak, as in the Snipe, is sufficiently acute to enable it to collect its food by the sense of touch without using the eyes.]

54. The *Snipe,—Scolopax gallinago,*—is smaller than the preceding; it inhabits marshes, the banks of rivulets, &c. Two other species are found in France, the Great Snipe, and Jack Snipe. All these birds are excellent to eat. The American species closely resemble those of Europe.

55. The AVOSETS,—*Recurvirostra,*—are distinguished by their long beak which is slender, elastic, and curved upwards, and by their feet being palmate almost to the ends of their toes. There is one species in Europe. [The *American Avoset,—Recurvirostra americana,*—arrives on the coast of Cape May, in New Jersey, late in April, and early in October retires with its young to winter in the South.]

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50. How are the Curlews characterised?
51. What are the characters of Snipe properly so called?
52. What are the habits of the European Woodcock?
53. What are the habits of the American Woodcock?
54. What is the Snipe?
55. How are the Avosets distinguished?

[illegible] Townsend

FAMILY OF MACRODACTYLI

56. The Grallatoriæ composing this family never have the beak as slender, and as weak as it is in the Longirostres, but, in other respects, its form varies very much. They are chiefly characterised by the arrangement of their toes, which are very long, fitted for walking on the grass of marshes; or even for swimming, in which case they are widened by a species of lateral border, (*Plate* 7, *fig.* 9.) but they never possess the smallest trace of a palmate membrane; the thumb is always quite long; the body is singularly compressed; and their wings are moderate or short, and their flight is feeble.

57. Some of them, (the Jacanas, for example,) have the wings armed with a spur; others are destitute of this kind of spur; they are distinguished into Rails and Coots, according as the front is feathered, or furnished with a horny shield.

58. The RAILS,—*Rallus*,—have the front feathered, the beak compressed and nearly straight, the head small, the toes destitute of lateral festoons, and the wings concave. They ordinarily keep concealed beneath the grass during the day, and seek their food, in the morning and evening, amidst the rushes and herbs of marshes and prairies.

59. The *Water Rail* of Europe,—*Rallus aquaticus*,—is fawn coloured brown, spotted with blackish above, bluish ash-colour beneath, and striped black and white on the flanks. Its flesh has a marshy odour. It is common along rivulets, and ponds; it swims well and runs lightly over the leaves of aquatic plants.

60. [The *Clapper Rail*, or *Mud-Hen*,—*Rallus crepitans*,—abounds in the Middle and Southern States. It is very numerous on the extensive salt marshes of New Jersey, where they are intersected by numerous tide water ditches. It winters near to, or within the southern boundaries of the Union.]

61. The *Crex*, or *Land Rail*,—*Rallus crex*,—is vulgarly called the King of the Quails, because, from the circumstance of arriving and departing with them, and keeping on the same grounds, it was believed that he led them. It lives and nests in the fields, and runs through the grass with great rapidity.

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56. How are the Macrodactyli characterised?
57. How is the family of Macrodactyli distinguished?
58. What are the characters of the Rails?
59. What are the charactors of the European Water Rail?
60. What is the Mud-Hen?
61. What is the King of Quails?

62. The Coots,—*Fulica*,—are readily distinguished from the Rails by a sort of horny plate, which extends from the base of the beak, and covers the forehead. This genus comprises the *Water-Hens*,—*Gallinula*,—which are characterised by their very long toes, furnished with a narrow border. In general, they live singly or in couples, sometimes in small troops of three or four, on stagnant waters; they swim and dive readily; during a great part of the day they keep concealed amongst reeds and rushes, and venture only upon the surface of the waters at night. Their flight, during which their legs are pendent, is neither lofty, sustained, nor rapid. There is one species widely spread in Europe. The American Coots resemble those of Europe.

FAMILY OF FLAMINGOS.

63. This division of the Order of Grallatoriæ is composed of a single genus, which is very remarkable for the singular structure of its beak, and the disproportionate length of the legs and neck. (*Plate* 5. *fig*. 11.)

64. *Flamingos*,—*Phœnicopterus*,—are large birds that stand high on their legs; they have palmate feet, an extremely long, slender neck, a small head, the upper mandible flat, and suddenly bent down at its middle to be applied over the lower mandible which is oval, and longitudinally hollowed into a semi-cylindrical canal; the edges of both mandibles are furnished with very delicate little transverse plates like those of ducks, and their tongue is thick and fleshy. They live on shell fish, insects, and the eggs of fishes, which they obtain by means of their long neck, and by bending down the head, to use the hook of the upper mandible to advantage.

65. The most common species is spread over the eastern continent, as far as the fortieth degree of north latitude. Numerous troops are seen every year on the southern shores of France, and sometimes they ascend as far as the river Rhine. The *Red Flamingo*,—*Phœnicopterus ruber*,—is from three to four feet high, of a purple red on the back, and rose coloured wings. Its habits are very remarkable. These birds are always in troops, and they form a line for the purpose of fishing, and this disposition to be in file remains, even when they repose on the shore. They appoint a sentinel for their common security; whether

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62. How are Coots distinguished from Rails? What are the characters of Water-Hens? What are their habits?

63. Is there more than one genus in the family of Flamingos?

64. How are Flamingos characterised?

65. What are the characters of the Red Flamingo? What are its habits? Upon what do Flamingos feed?

fishing or at rest, one of them is always on the lookout, with head erect, and if any thing alarms him, he utters a braying cry, resembling the sound of a trumpet, which is the signal for departure; as soon as the troop rises, and when they fly, they still preserve the line. The manner in which they construct their nest, is also worthy of attention; they ordinarily build on drowned or wet shores; they construct it on the water's edge, of marsh mud, in the form of a sugar loaf, truncated at top, about twenty inches high, and as they cannot, on account of the extreme length of their legs, squat in their nest, they straddle over it, the legs hanging down on each side, and resting on the ground.

66. The ancients esteemed the flesh of the Flamingos very highly, and its fleshy tongue was particularly prized by the Romans; but the moderns, who have had occasion to eat these birds, have found the flesh oily and disagreeable.

67. The Glarioles and Vaginals, or Sheath-bills, offer nothing very interesting; the first are found in all the northern part of the eastern continent, and the second in New Holland.

LESSON VIII.

Order of Palmipedes —*Zoological Characters.—Habits.—Division into four families.*

Family of Divers.—*Grebes.—Auks.—Penguins.*

Family of Longipennes.—*Petrels.—Albatross.—Gulls.—Sea-Swallows.*

Family of Totipalmatæ.—*Genus of Pelicans, (Pelican properly so called.)—Organization.—Habits.—Frigate Bird.—Boobies.*

Family of Lamellirostres.—*Genus of Ducks.—Swans.—Geese.—Ducks.—Eiders.—Genus of the Mergansers.*

ORDER OF PALMIPEDES.

1. This name is given to birds in which the toes are united by a palmate membrane, but in other respects without the conformation that belongs to the Grallatoriæ; every Palmipede has, in fact, the interval which separates the toes, filled up by a broad membrane, which envelopes them to near the nail, or in other

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66. Is the flesh of Flamingos considered good food?

67. What are Glarioles and Vaginals?

1. What are Palmipedes? What are the most remarkable parts of their organization? How is this order divided?

words, they are web-footed. Their feet are made for natation, that is, they are placed far back on the body, and sustained by strong, compressed tarsi. A close, lustrous plumage imbued with an oily fluid, and a thick down next to the skin, protect them against the water upon which they dwell. They are the only animals of this class, in which the neck exceeds—and sometimes very much—the length of the feet, for the reason that when swimming on the surface of the water, they often have to seek anima[illegible]pon which they feed in its depths. The localities which they in[illegible]t, removes most of them from the empire of man, and in many[illegible]spects even from the investigation of naturalists. Birds of this order generally possess a system of organization which is strong and appropriate for extensive flight; their sternum is very long, affording ample protection to most of their viscera, and has but one notch or oval hole on each side, which is filled by membrane, so that this bone affords a wide surface for the attachment of the depressor muscles of the wings. This order is divided into four families according to the following characters:

				(Families.)
Palmipedes.	Having excessively short wings, and the legs placed so far back, that they are obliged, when on land, to preserve an almost vertical position. They fly little, or not at all.			Brachypteræ. or Divers.
	Having the wings of ordinary length, or even very long, and the feet so placed as to enable the animal to walk when in a horizontal position.	The beak horny.	The thumb free, or wanting. Wings excessively long.	Longipennes.
			The thumb united to the other toes by a common membrane. Wings long.	Totipalmatæ.
		The beak covered by a soft skin, and the edges furnished with transverse lamellæ, or very fine teeth.		Lamellirostres.

FAMILY OF BRACHYPTERÆ, OR DIVERS.

2. They have the legs placed farther back than all other birds, which renders it laborious for them to walk, and generally obliges them to keep in an erect position when on land, (*Plate* 6, *fig.* 1, *and* 2.) As most of them fly badly, and as many of them cannot even fly at all, in consequence of the extreme shortness of their wings, they may be regarded as belonging, almost exclu-

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2. What are the characters of the Brachypteræ? What are their habits? How is this family divided?

sively, to the surface of the water: their plumage is very close in structure, and even frequently presents a smooth surface and a silvery brightness. They swim perfectly, with the body entirely under water, and use their wings almost as if they were fins. This family is divided into three tribes, namely:

1st. The DIVERS, in which the beak is moderate, strong, straight, very pointed, and compressed, and the nostrils are lateral, linear, and half closed by a membrane.

2nd. The AUKS, in which the beak is very c[illegible]ressed, trenchant, and ordinarily furrowed transversely.

3d. The PENGUINS, in which the beak is pointed or hooked, and the wings are furnished only with feathers, which are so short that they resemble scales.

3. The DIVERS, are sub-divided into Divers properly so called, Grebes, Guillemots, &c.

4. The DIVERS PROPERLY SO CALLED,—*Colymbus*,—are recognised by their long toes, which are entirely palmate, and armed with pointed nails; the thumb is short and provided with a small membrane. Their tail is very short and round. These birds never quit the water except during the season of laying, and then they walk by the assistance of their wings; if these supports fail them, they fall upon the belly, and have great difficulty in rising They keep habitually under water, and scarcely show any thing but the head to breathe from time to time. They fly well, but rarely, and dive at the flash of a gun, without attempting to fly. They feed on fishes, spawn, and aquatic insects. The most common of its tribe, in the United States, is the *Loon*, or *Great Northern Diver*,—*Colymbus glacialis*.

5. The GREBES,—*Podiceps*,—(*Plate* 6, *fig*. 2.) in place of true palmate membranes, have the toes widened like the Grallatoriæ of the genus Fulica, and the anterior ones being united only at the base by membranes. They live on lakes and ponds, and build among the rushes. They swim with ease, and dive frequently; the semi-metallic lustre of their plumage has caused their skins to be applied to the same use as fur. There are several species in Europe which are not well distinguished; the largest is of the size of a duck, and the smallest is not larger than a quail.

6. The name of GUILLEMOTS,—*Uria*,—is given to Divers that want the thumb, and that have shorter wings than the preceding.

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3. How are the Divers divided?

4 How are Divers properly so called, characterised? What are their habits? What is the Loon?

5. What are the characters of the Grebes?

6. What are Guillemots?

7. Birds of the tribe of AUKS,—*Alca*,—have a broad, straight, compressed beak, which is very much curved at the point. The nostrils, which are about the middle of the beak, are almost closed by a membrane covered with feathers; the feet are short, have only three toes, and are completely palmate; the nails are slightly curved. They have the same habits as the birds of the preceding genera, and, like them, inhabit the north. With the exception of a single species, they all fly but little, and always grazing, or lightly touching the surface of the water. [The *Razor-bill Auk*,—*Alca torda*,—inhabits the coldest regions of the northern hemisphere. It is gregarious in its habits, and flies rapidly, but near the surface of the water. The *Great Auk*, or *Northern Penguin*,—*Alca impennis*,—inhabits the highest latitudes of the globe, dwelling by choice and instinct, amidst regions covered with eternal ice. Its wings are extremely short and useless for flight.]

8. The tribe of PENGUINS,—*Aptenodytes*,—(*Plate* 6, *fig.* 1.) comprises Palmipedes, not one of which can fly; their little wings are covered with mere vestiges of feathers, which at first sight resemble scales; their feet, which are placed farther back than in any other bird, only support them when they rest upon the tarsus, which is widened like the sole of the foot of a quadruped; they have a small thumb directed inwards, and the three anterior toes are united by a membrane. These birds never quit the water, except to lay, and then they are obliged to drag themselves along on the belly. They are only found in the antarctic seas. The *Great Penguin*,—*Aptenodytes patagonica*,—is the size of a goose, slate colour above, with a black mask, and a lemon coloured tail.

FAMILY OF LONGIPENNES.

9. This family contains birds of the high seas which from their power of extensive flight, are every where found, and which navigators meet with in every latitude. They have sharp, slender wings, (*Plate* 6, *fig.* 4.); their pectoral muscles are very powerful, their feet are widely palmate, which better enables them to repose upon the waves; and their piercing sight, inevitably prevents the escape of fishes, of which they are very fond, and which they seize, not by diving, but skimming the surface. These birds are frequently met at incredible distances from land, and they are seldom seen beyond the limits of the zones, which they inhabit

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7. What are the characters of the Auks? What is the Razor-bill Auk? What is the Great Auk?

8. What are the characters of Penguins? What regions do they inhabit?

9. What are the habits of the Longipennes?

through preference. They are recognised by the freedom of the thumb, or its entire absence, by their very long wings, and by their beak, which is without teeth, hooked, or simply pointed.

10. The following table exhibits the characters of the principal genera composing this family.

				(Genera.)
LONGIPENNES, having	The nostrils in the form of a tube.	A nail planted in the heel, and taking the place of a thumb.		PETRELS.
		Without a vestige of a thumb,		ALBATROSS.
	The nostrils oblong, and pierced in different places.	Legs pretty long; tail not forked		GULLS.
		Legs very short; tail generally forked.	Beak compressed, of the ordinary form.	SEA-SWALLOWS.
			Beak like the blades of a pair of scissors.	SKIMMERS.

11. The PETRELS,—*Procellaria,*—have a beak, hooked at the end, the extremity of which seems to consist of a distinct piece, articulated with the remainder; their nostrils are united in a tube laid on the back of the upper mandible; in place of a thumb, there is a nail planted in the heel. Of all the palmipedes these remain most constantly at a distance from land; and when a tempest supervenes, they are often forced to seek shelter on reefs and ships, which circumstance has obtained for them the name of *Storm Birds.* That of Petrel, (little Peter) is given to them, it is said, from their habit of walking on the water, by the assistance of their wings, which reminds us of the miracle of Saint Peter walking on the Lake of Gennesaret. They build their nest in holes, in rocks, and they eject upon those that attack them an oily fluid with which their stomach appears to be always filled. The greatest number of species inhabit the seas of the Antarctic pole.

12. These birds are nocturnal; they seek their food only in the morning, or evening twilight. During the day they lie concealed in caverns and clefts of rocks. They feed on the bodies of dead cetacea, mollusca, and worms that float on the surface of the water.

To this genus belong the Stormy Petrels, or Mother Carey's chickens,—*Procellaria pelagica,*—Cape Pigeons, &c.

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10. What are the principal genera of the family of Longipennes?
11. What are the characters of the Petrels?
12. What are the habits of Petrels?

13. The ALBATROSSES,—*Diomedea*,—have a very long, very strong, hard, trenchant and compressed beak, which is straight at the base, and suddenly curved towards the end; the nostrils are tubular, and placed in a furrow; the feet are short and palmate, and have but three toes; the nails are short and dull.

14. The Albatrosses are the largest of all oceanic birds; their heavy, massive form seems to bear very little relation to their rapid and long continued flight, which has caused them to be called by mariners *Cape Sheep*, or *Man-of-war-birds*. The species best known, is white with black wings. Of all birds, this one is seen at the greatest distance from land; it generally inhabits extra-tropical latitudes, and it is chiefly in those seas which wash the three great southern capes, that it is most commonly seen. It was for a long time believed that it belonged exclusively to the southern hemisphere, and was never seen in the north.

15. The genus of GULLS,—*Larus*,—*(Plate 6. fig. 5.)* have a moderate entire beak, which is naked at the base; the upper mandible is curved at the point, and the inferior, swelled and angular beneath; the nostrils are median and longitudinal; the tarsi are pretty long, and naked above the knee: the thumb which is articulated high up, is sometimes without a nail; the tail is rectilinear, and the wings are long. The name of *Goëlands*, or *Gulls properly so called*, is given to large species, the size of which exceeds that of a duck, while the smaller species are called *Mouettes*.

16. Mouettes inhabit the sea shore of all parts of the globe. They are clamorous and voracious; they feed on fishes and small animals, as well as on carrion and dead bodies; their gluttony is such that they may be easily taken by enveloping a hook with feathers which, floating on the surface, in their eyes, resembles a little fish.

17. The SEA SWALLOWS, or TERNS,—*Sterna*,—derive their name from their excessively long wings and forked tail which give them the appearance of common Swallows. Their beak is as long or longer than the head, almost straight, compressed, trenchant, acute at the point, and both mandibles are of equal length; the nostrils are about the middle of the beak; the feet are small, naked above the knee, the tarsi are very short, and the

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13. What are the characters of the Albatross?
14. Where are Albatrosses found?
15. How are Gulls characterised? What are Goëlands?
16. What are Mouettes?
17. What are the characters of Sea-Swallows?

anterior toes are united by a membrane. Their nails are small and arcuate. These birds fly a great deal, rarely alight upon the water, and do not swim. They feed on little fishes or insects which they seize as they fly, skimming the surface of the water. All birds of this genus are clothed in white, with the back, wings, and tail, pearl gray.

18. The *Skimmers*, (Cut-waters, or Shear-waters,—***Rhynchops***,—are remarkable for the singular form of their beak, the lower mandible of which is much longer than the upper, both being flattened, so as to form simple blades, which meet without clasping. They inhabit the West Indies. [The Cut-water, or Black Skimmer,—***Rhynchops nigra***,—is a bird of passage in the United States. It arrives from its winter quarters about the middle of May; on the sea shores of New Jersey, where it breeds: its favourite haunts are along the low sand-bars and dry flats of the strand, in the immediate vicinity of the ocean.]

FAMILY OF TOTIPALMATÆ.

19 The birds of this family are remarkable for having the thumb united to the other toes in the same membrane, and notwithstanding this organization, which converts their feet into excellent paddles, they are the only birds among the Palmipedes that perch on trees. They all fly well, and have short feet.

The characters of the most important genera of this family are contained in the following table:

				(Genera.)
Totipalmatæ.	Having a large cutaneous pouch or sac, suspended between the branches of the lower mandible.			Pelicans.
	Without a sac beneath the lower jaw.	The beak straight, compressed, and hooked at the end.	Tail round, (of fourteen quills.)	Cormorants.
			Tail forked.	Frigate Birds.
			Tail pointed	Boobies.
		Beak straight, slender, and pointed,		Darters, &c.

20. The Pelicans,—*Pelicanus*,—(*Plate* 6, *fig.* 3.) have a long, straight, broad beak, which is very much depressed; the upper mandible is flattened and hooked, and the lower one is formed of two bony branches between which hangs a large pouch of naked skin. The face and throat are naked, the feet are strong and short, and all the toes are united by a single membrane. These singular animals are expert swimmers, and are found both on salt and fresh waters. They feed on fishes, and can store an

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18. How are the Skimmers characterised? What is the Black Skimmer?
19. For what are birds of the family of Totipalmatæ remarkable?
20. How are Pelicans characterised? Where are they found?

ample supply of them in their pouch, which is prodigiously dilatable. They are spread over all the warm, temperate, and even the almost frigid climates of the globe, and one of the species, the common Pelican, may be considered a cosmopolite.

21. The *Common Pelican*,—*Pelicanus onocrotalus*,—(sometimes called *onocrotalus*, because its voice has been compared to the braying of an ass,) the largest web-footed water-fowl known, is five or six feet long with an alar spread of twelve feet; the beak alone is about a foot and a half in length, and its pouch will contain a dozen quarts of water; its plumage is more or less purely white, according to its age, and the remiges are black. It flies well, and sometimes rises to a great height; but in general, it skims the surface of the water, or balances at a moderate elevation, in order to precipitate itself more readily upon its prey; sometimes it is seen to beat the water with its wings as if to disturb it, and alarm the fishes, and we are assured, when Pelicans are assembled in troops, they fish in company, by forming a large circle which they gradually reduce to imprison the fishes, until, at a given signal, they all strike the water at the same time, and, under favour of the confusion, dive in and seize their victims. The fishing over, they retire to some rocky point or shoal, and there digest their gluttonous meal at their ease. They can perch on trees, (which is very rare among the web-footed birds,) but they do not nest in them; they build on the ground, in an excavation, which they line with herbs. The female lays from four to six eggs, and feeds her young by disgorging before them the fishes, which she brings in her pouch for their use. It is also said that she carries them water in the same way, and it is probable that the movement which she makes to empty her pouch, by pressing it against her breast, has given rise to the fable, referred by some writers, to the pretended habit which these birds had of opening their breast to feed their young family on their own blood.

22. The Cormorants,—*Phalacrocorax*,—have an elongated, compressed beak, the upper mandible hooked at the end, the skin of the throat is but little dilatable, and does not form a pouch as in the Pelicans; the nail of the middle toe is toothed like a saw, and the tail, which consists of fourteen feathers, is round. They are excellent divers: they ordinarily swim with only the head above water, and they pursue fishes, upon which they feed, with astonishing rapidity, entirely under water. Their flight is rapid and sustained; but on land, they walk badly, and sustain

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21. What are the characters of the common Pelican? What are its habits?

22. What are the characters of Cormorants? How is the common Cormorant characterised?

themselves almost in a vertical position by the assistance of the tail. The *Common Cormorant*, is of the size of a goose, and its plumage is greenish black; it inhabits the northern countries of both continents; it nests sometimes in rocky clefts, and sometimes on trees or among rushes, and feeds chiefly on eels. The *Shags* belong to this genus.

23. The FRIGATE BIRDS,—*Tachypetes*,—(*Plate* 6, *fig.* 4.) also differ from Pelicans in the absence of the sub-maxillary pouch, in their forked tail, and in their short feet, the membranes of which are deeply notched; they have long wings that spread to a great extent, and a beak, both mandibles of which are curved at the end.

24. These birds only inhabit inter-tropical regions, and their flight is so powerful and rapid, that they fly to great distances from land, and for this reason they have obtained the name of Man-of-war birds. They are met with more than four hundred leagues at sea, and they wage an active war against the flying-fish, which, in order to escape from the pursuit of other fishes, springs entirely out of water. Frigate birds also pursue Boobies, and by striking them with their wings and beak, force them to disgorge the product of their fishing, which they dexterously seize before it falls into the water.

25. The BOOBIES,—*Sula*,—very much resemble the preceding, but their beak is straight, slightly arcuate at the point and armed on the edges, with teeth, the points of which are directed backwards; the throat, as well as the vicinity of the eyes, is naked, and but little extensible; the wings are less than those of the Frigate bird, and the tail is a little wedge-shaped. They obtain their name of Boobies from the stupidity they display in submitting to the attacks of man and animals.

26. The DARTERS,—*Plotus*,—(*Plate* 6, *fig.* 8) resemble the Cormorants in the form of their body, and in their feet, but are distinguished from them by the length of their neck, their small head, and by their straight, slender and pointed beak, which is dentate on the edges. They inhabit the warm countries of both hemispheres, and their habits are nearly the same as those of the preceding.

27. The *Tropic Birds*,—*Phæton*,—differ from the other Totipalmatæ in having the head entirely feathered, and by the two long, straight feathers of the tail, which at a distance resemble

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23. What are the characters of Frigate Birds?

24. What are the habits of Frigate birds? Why are they called Man-of-war birds?

25. What are the characters of Boobies?

26. What are Darters?

27. What are the characters of Tropic birds? Why are they so called?

straws. They seldom resort to the land except to breed, and rarely quit the torrid zone. Their appearance is an indication to navigators of their vicinity to that region.

FAMILY OF LAMELLIROSTRES.

28. The Palmipedes of this family have a thick beak, covered with a soft skin rather than true horn, and its edges are furnished with lamellæ or little teeth, (*Plate* 6, *fig*. 6, 7, *and* 9. *and Plate* 8, *fig*. 14.); the tongue is large and fleshy, and dentate on its edges; they have three toes in front, united by membranes, and one behind, which is free. Their wings are of moderate length, and they live more on fresh waters than at sea.

They are divided in the following manner:

LAMELLIROSTRES, having the beak
- Very broad, and the edges furnished with lamellæ. — *Tribe of Ducks.*
  - Beak higher than wide at its base, and
    - Not narrowing in front. Neck very long. — SWANS.
    - Narrowing in front. Neck of moderate length. — GEESE.
  - Beak not so high as it is wide at its base; neck pretty short. — DUCKS Properly so called.
- Slender and armed with little teeth. — *Tribe of Mergansers.*

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28. What are the characters of Palmipedes?

29. All the Palmipedes of the Tribe of Ducks, which naturalists distinguish under the name of Anas, have a moderate, strong, straight beak, which is more or less depressed, convex above, flat below, rounded at the end, and terminated by a smooth scale in the form of a nail. The edges of each mandible are armed with little projecting lamellæ, which are delicate and placed transversely, and seem designed to permit the escape of water after the animal has seized its prey. Their food consists of fishes, mollusca, insects, grains, &c. To obtain their nourishment, some submerge themselves entirely, while others remain on the surface, and only plunge in their head and long neck. They are seldom on land.

30. This tribe is composed of Swans, Geese, and Ducks properly so called.

31. The Swans,—*Cygnus*,—(*Plate* 6, *fig*. 9.) are the largest birds of this group, and are distinguished by the form of the beak which is as wide in front as it is behind, and higher than it is wide at its base. They feed chiefly on grains, and the roots of aquatic plants. They swim with such facility, that a man walking rapidly along the shore would have difficulty in keeping up with them, and they fly with a great deal of lightness and strength. Whether on the water or in the air, they are almost always seen in troops. Their young quit the nest, swim and eat alone immediately after they are hatched. Their down, which is very fine, serves for many purposes. Their plumage is generally white.

32. These birds have long been celebrated for the beauty of their form, and for the grace with which they swim. Their trachea is bent on the sternum, but their voice is not rendered therefore more agreeable, and the ancients have very gratuitously given celebrity to the song of the Swan.

33. In New Holland, there is a *Black Swan*, which is the size of the common species, but its carriage is less graceful and elegant.

34. Geese,—*Anser*,—have a moderate or short beak, narrower before than behind, and higher than wide at its base; their legs which are longer than those of Ducks properly so called, and placed nearer to the middle of the body, give them greater facility in walking. They feed on aquatic plants and grains.

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29. How are Palmipedes of the tribe of Ducks characterised? Upon what do they feed?

30. What genera compose the tribe of Ducks?

39. What are the characters of Swans?

32 What is peculiar in the trachea of Swans?

33. Are all Swans white?

34. What are the characters of Geese? What are their habits?

They live almost constantly on great humid prairies and vast marshes. Wild geese live in numerous troops and always have some of them on the watch: they are extremely suspicious. The males are not distinguishable from the females by the colour of their plumage; they moult but once a year; their voice is strong and clamorous. They breed on the ground, swim little, and do not dive at all. They fly in flocks, in two lines in the form of an angle, or in a single line, when the troop is numerous; the one which is at the point of the angle, or at the head of the line, falls into the rear when fatigued, and they all succeed each other in turn.

35. DUCKS PROPERLY SO CALLED,—*Anas*,—(*Plate* 6, *fig.* 6.) comprise species almost all of which resemble each other, but still differ in slight particulars. They differ from Swans and Geese, not only in their beak, but also in being much smaller and having a shorter neck; their trachea is inflated at its bifurcation.

36. Ducks are spread through all the marshy or maritime countries of the globe. They are aquatic and migratory, and approach the sea coast in flocks during autumn and winter, but frequent fresh water ponds, lakes and rivers, particularly those with grassy and sedgy borders; they prefer shallow places in which they can fathom the bottom with the beak without the necessity of diving deeply, to which they only have recourse in the breeding season, or to avoid their enemies. The species are numerous, but they are most abundant in temperate regions.

37. Ducks are divided into *Sea-ducks*, *Eiders*, *Common Ducks*, *Teals*, &c.

The *Common Duck* has been long domesticated, and inhabits all our poultry yards.

38. [The *Canvass Backed Duck*,—*Anas valisneria*,—so well known as a delicacy of the table, is a species peculiar to the continent of America. It is of a steel gray; beak straight, nearly two and a half inches long, its sides parallel. The *Male* is white waved with black; the head tinged with black anteriorly, and the neck glossy chestnut: a black pectoral belt. *Female*, dull whitish, waved with black; head, neck, and breast, brownish.]

39. The *Eider*,—*Anas mollissima*.—(*Somateria*,) is a species of Duck celebrated for the down which it furnishes, known under the name of *Eider down*. The male is nearly two feet long, and

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35. What are Ducks properly so called? What is the peculiarity of the trachea in Ducks properly so called?
36. What are the habits of Ducks?
37. How are Ducks divided?
38. How is the Canvass Backed Duck characterised?
39. What are the characters of the Eider? How is Eider down obtained?

its alar extent is about two feet eight inches; it is whitish, with the front, and sides of the crown, belly, and tail, black. The female, which is smaller, is gray, speckled brown. Clothed in a thick fur, the Eiders brave the rigours of the coldest countries, and advance as far as Spitzbergen. The down which they pluck from the breast and belly to line their nest, is sought for with a great deal of pains in those countries where these birds are common: it is the softest, the lightest, the warmest, and most elastic of all downs, that which is plucked from the dead bird is of inferior quality.

40. The genus of MERGANSERS,—*Mergus*,—comprises those Palmipede Lamellirostres that have a moderate or long, straight, slender beak, in the form of an elongated and almost cylindrical cone, wide at the base, and the point of the upper mandible is very much curved and hooked. The edges of both mandibles are serrated, and the teeth are directed backwards, (*Plate* 6, *fig*. 7.); the nostrils are about the middle of the beak; the feet are short, and the toes are entirely palmate; the posterior toe is free, and has a border. These birds swim perfectly, often having only their head above water, and they dive still better; their flight is rapid and sustained, but from the posterior position of their feet, they are scarcely capable of walking, tottering from side to side with the utmost embarrassment. In other respects they resemble Ducks. They dwell habitually in cold countries, and are only seen commonly in temperate climates on the approach of winter. Of the five species known, one is peculiar to America, the *Hooded Merganser*,—*Mergus cucullatus*,—and all are found on this continent.

We next proceed to study the REPTILES, which form the THIRD CLASS OF THE BRANCH OF VERTEBRATA.

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40. What are the characters of the Mergansers?

END OF THE THIRD BOOK OF NATURAL HISTORY.

ORNITHOLOGY.

GLOSSARY.

Abdomen.—From the Latin *abdere*, to conceal; the belly. The chief viscera contained in the abdomen, are the stomach, intestines, liver, &c. &c.

Accipitres.—From the Latin *accipere*, to seize hold of. Systematic name of the order of birds of prey.

Acuminate. / **Acuminated.** From the Latin *acumen*, a sharp point. Ending in a point.

Æanthe.—From the Greek *aemi*, which is from *aeô* or *aô*, to agitate, and *anthe*, a flower.

Aedon.—From the Greek *aedôn*, a songster, which is derived from *aeidô*, I sing. A term applied to many birds.

Aerial.—From the Latin *aerius:* belonging to the air.

Æruginosus.—Latin. Rusty.

Æsalon.—Latin. Name of a kind of Falcon.

Æstiva.—Latin. Belonging or relating to summer.

Alar (Extent.)—From the Latin *ala*, a wing. Belonging or relating to the wings. A term used in speaking of the stretch of the expanded wings.

Alauda.—Latin. A lark.

Albino.—Spanish, formed from the Latin *albus*, white. This word is employed to designate those individuals of the human race who have the skin and hair white, the iris very pale and bordering on red or pink; and the eyes so sensible, that they cannot bear the light of day. The word is also applied to animals of the lower orders that are similarly characterised.

Alca.—The systematic name of a tribe of web-footed birds.

Alcedo.—Latin name of the Kingfisher.

Alcyon.—From the Greek, *alkuôn*, which is formed from *als*, the sea, and *kuô*, I produce. (The Halcyon, the name of a fabulous bird of the ancients, which was supposed to build its nest on the sea, at a season when it was presumed to be calm. This season embraced a period of fourteen days, which were called the *Halcyon days.*) The specific name of a kingfisher.

Alector.—From the Greek, *alektôr*, the domestic cock.

Alpestris.—Latin. Belonging or relating to the Alps.

Americana. / **Americanus.** Modern Latin. Belonging or relating to America.

Ampelis.—From the Greek, *ampeleôn*, a singing bird. The systematic name of the crown birds.

Analogous.—From the Greek, *ana*, between, and *logos*, reason. Having some resemblance or relation, though differing in essential particulars. Similar.

Anas.—From the Greek, *nessa*, a duck, which is formed from *neô*, I swim. The systematic name of the tribe of ducks.

Anchylosed.—From the Greek, *agkulos*, crooked. A joint that has become stiff and immoveable is said to be anchylosed.

Anser.—Latin. A goose.

Anthus.—Latin. Name of the Titlark or Meadow-lark.

Apparatus.—Latin, *ad*, for, and *parare* to prepare; a collection of instruments or organs for any operation whatever. An assemblage of organs. In Latin this word is the same in the plural—but in English some writers make the plural, *apparatuses*.

Apiaster.—Modern Latin, formed from *apis*, a bee. The specific name of the common Bee-eater.

Apivorus—From the Latin, *apis*, a bee, and *vorare*, to eat. Bee-eating. One that eats bees.

Appendices—The plural of appendix.

Appendix.—Latin, *ad*, to, and *pendere* to hang; something added. Any part that adheres to an organ, or is continuous with it.

Apoda.—From the Greek, *a*, without, and *pous*, (in the genitive, *podos*,) a foot. Without feet. Applied to birds of Paradise, because it was once supposed they had no feet.

Aptenodytes.—From the Greek, *a*, privative—*ptenos*, winged; having the power of flying, and *dutes*, a diver. The systematic name of Penguins.

Apus.—Latin. Specific name of the common Martin.

Aquaticus.—Latin. Aquatic. Relating or belonging to water.

Aquila.—Latin. An Eagle.

Ara. } Systematic names of a
Aracari. } Maccaw.

Archipelago.—From the Greek, *arche*, beginning, and *pelagos*, sea; an extent of sea sprinkled with islands.

Arcuate.—From the Latin, *arcuo*, I bend like a bow. Bent like a bow; bow-shaped.

Ardea.—Latin. A Heron.

Argonauts.—From the Greek, *argo*, the name of a vessel, and *nautes*, a navigator. The name of the ancient Grecian princes who sailed on board of the ship Argo with Jason, to conquer the golden fleece.

Argus.—The name of a hero in mythology, who was said to have had a hundred eyes, fifty of which were open while the other fifty slept; after his death, Juno changed him into a peacock. From the spots in its tail, sometimes called eyes, this name has been applied to a species of Pheasant.

Articulate—From the Latin, *articulus*, which is the diminutive of *artus*, a limb, which is derived from the Greek, *arthron*, a joint. To join or joint. To form words; to utter.

Articulation.—A joint.

Arvensis.—Latin. Formed from *arvum*, a field. Relating or belonging to fields.

Astur—Systematic name of the Goshawks.

Aura.—Latin. An air or emanation. The specific name of a kind of Vulture.

Auratus.—Latin. Gilded; golden. Belonging or relating to gold.

Barb.—From the Latin, *barba*, a beard. The filaments which are attached to two sides of the stalk of a feather, are called barbs or beards.

Barbule.—The diminutive of barb, and is applied to designate the filaments which are found on the edges of the barbs, composing a feather.

Barbarus.—Latin. Foreign; barbarous; cruel.

Barbatus—Latin. Bearded; having a beard.

Base of support.—The space comprised between the points by which an object supports itself upon a resistant body.

Beak.—The bill or horny mouth of a bird.

Bec-figue.—French name of the Titlark.

Becca fica—Italian name of the Titlark.

Bicolor.—Latin. Particoloured.

Bifid.—From the Latin, *bis*, twice, and *findere*, to split. Split or divided into two separate parts.

Bifurcate—From the Latin, *bis*, twice, and *furca*, a fork. Divided or separated into two branches.

Bifurcation.—From the Latin, *bis*, twice, and *furca*, a fork. The point where two branches separate.

Bombycilla.—From the Greek, *bombux*, a silk worm. The systematic name of the Chatterers.

Brachypteræ.—From the Greek, *brachus*, short, and *pteron*, a wing. Having short wings. The systematic name of a family of divers.

Brevipennes.—From the Latin, *brevis*, short, and *penna*, a wing. Having short wings. The systematic name of a family of the order of wading birds.

Bronchia.—The singular of

Bronchiæ.—From the Greek, *brogchos*, the throat. The two branches of the wind-pipe which convey air to the lungs.

Bubo.—Latin. An Owl.

Buceros.—From the Latin, *bucerus*, horned. The systematic name of the Calaos or hornbills.

Bulb.—From the Greek, *bolbos*, a round root. A name given by anatomists, to various parts which resemble certain bulbous roots in shape.

Bulbus.—Latin. A bulb. *bulbus glandulosus*, is the second stomach of birds.

Buphaga.—From the Greek, *bous*, an Ox, and *phagein*, to eat. Systematic name of the beef-eaters.

Buteo.—Latin. A Buzzard.

Californianus.—Latin. Californian.

Callous.—From the Latin, *callus*, hardness. That which is hard, or indurated.

Camelus.—Latin. Camel.

Canadensis.—Latin. Canadian. Belonging or relating to Canada.

Canaria.—Latin. Belonging or relating to the Canary Islands.

Cancroma.—The generic name of the Boatbills.

Cannabina. — Latin. Belonging or relating to hemp. The specific name of the Linnet.

Capistrum.—The sides of the head immediately behind the bill.

Caprimulgus.—Latin. A milker of goats. Systematic name of the Goatsuckers, which is derived from a notion entertained by the vulgar, of their sucking goats, and even cows.

Caravan.—From the Persian, *keraouan*, an assemblage of persons travelling together. A troop of travellers, merchants or pilgrims, who, for greater security, cross the deserts and other places infested by Arabs and highwaymen, in company.

Cardia.—From the Greek, *kardia*, the heart. The left opening of the stomach, where the œsophagus enters it.

Carduelis.—Latin. A bird feeding among thistles. Specific name of the Goldfinch.

Carneous.—From the Latin, *caro*, (in the genitive, *carnis*, flesh.) Belonging or relating to flesh; fleshy.

Carnivorous.—From the Latin, *caro*, *carnis*, flesh, and *voro*, I eat. Animals that feed on flesh are said to be carnivorous.

Carolinensis. — Latin. Carolinian. Belonging to Carolina.

Carpal.—Belonging or relating to the carpus.

Carpus.—From the Greek, *karpos*, the wrist. The part between the fore-arm and hand.

Cartilage.—Gristle. A solid part of the animal body of medium consistence between bone and ligament.

Cartilaginous. — Partaking of the nature of cartilage.

Caruncle.—From the Latin *caruncula*, the diminutive of *caro*, flesh. A small portion of flesh; a fleshy excrescence; the gills of a cock, for example.

Casuarius.—Latin. A Cassowary.

Cassowary.—From the Malay name of this bird, *Casuwaris*.

Cathartes.—From the Greek, *kathartes*, one who purifies. The generic name of certain Vultures.

Centre of gravity.—The name given to the point about which all points of a body reciprocally balance each other.

Cera.
Cere. A coloured membrane investing the base of the upper mandible: as in Hawks, and a few other birds.

Certhia.—The systematic name of the Creepers.

Cervical.—From the Latin, *cervix*, the neck. Belonging or relating to the neck.

Cetacea.—In Latin, *cetaceus*, which is formed from the Greek, *ketos*, a whale. Naturalists use the word to designate pisciform mammals that have fins in place of feet, and inhabit the sea.

Charadrius.—Latin. (A bird, the seeing of which, it was supposed, cured those that had the jaundice.) The generic name of the Plover.

Chætura.—Systematic name of the Swifts.

Chyle.—From the Greek, *chulos*, nutritious juice. A nutritive fluid of a whitish appearance, which is extracted from food by the action of the digestive organs.

Chyliferous.—From the Latin, *chylus*, chyle, and *fero*, I carry. Carrying or conveying chyle.

Ciconia.—Latin. A Stork.

Ciliated (tongue)—When the tongue is edged with fine bristles, as in ducks.

Cinclus.—From the Greek, *kigklos*, name of a bird. Generic name of the Water-thrush.

Cineraceus.
Cinerea.
Cinereus. Formed from the Latin, *cineres*, ashes. Belonging or relating to ashes; ashy; ash-coloured.

Circus.—Latin. A gentle Falcon. The generic name of the Harriers.

Citrinella.—Latin. Formed from *citrus*, a citron tree. The specific name of the Yellow Bunting.

Clavicle.—From the Latin, *clavis*, a key. The collar-bone.

Cleft.—A space made by the separation of parts; a crack; a crevice. The line of separation betwixt the two mandibles, shows to what distance the beak is cleft from its point.

Cloaca.—From the Greek, *kluzô*, I wash. The pouch at the extremity of the intestinal canal, in which the solid and liquid excretions are commingled in birds, fishes, and reptiles.

Coccothraustes.—From the Greek, *kokkos*, a kernel, a grain, and *thrauô*, I break. The systematic name of the Grosbeaks.

Cœca, or **Cæca.**—Plural of Cœcum.

Cœcum, or **Cæcum.**—From the Latin, *cæcus*, blind. The *blind gut*, so called from its being perforated at one end only.

Cœlebs.—Latin. Unmarried, solitary, lonely.

Collurio.—From the Greek, *kollaô*, I join or fasten together. The specific name of the Butcher Bird.

Colubris.—The specific name of a Humming Bird.

Columba.—Latin. A Pigeon.

Colymbus.—From the Greek, *kolumbaô*, I dive. Systematic name of the Divers.

Commissure.—From the Latin, *committo*, I join together. A point of union between two parts. The point where the two mandibles are joined is called the commissure of the beak.

Communis.—Latin. Common.

Compressed (beak.)—Flattened at the sides vertically.

Concha.—The hollow part of the cartilage of the external ear.

Conirostres.—From the Latin, *conus*, a cone, and *rostrum*, a beak. The systematic name of a family of passerine birds.

Coracoid.—From the Greek, *korax*, a crow, and *eidos*, resemblance. Resembling the beak of a crow. The coracoid bone is the posterior clavicle of birds.

Corax.—Latin. A Raven.

Cornu.—Latin. A horn.

Corvus.—Latin, A Crow.

Cosmopolite.—From the Greek, *kosmos*, world, and *polites*, citizen. A citizen of the world. Peculiar to no country.

Coturnix.—Latin. A Quail.

Courser.—A race horse.

Coverts.—The small feathers which lie in several rows on the bones of the wings are called the *Lesser coverts;* those that line the under side of the wings, the *Under coverts;* those feathers that lie immediately over the quill feathers, and secondaries, are the *Greuter coverts;* and the *Tail coverts,* are those feathers that cover the tail on the upper side, at the base.

Cranium.—From the Greek, *kranon,* head. The skull.

Crepitans.—Latin. Cackling, ringing, making a noise, rattling, chattering.

Crepuscular.—From the Latin, *crepusculum,* twilight. Belonging or relating to twilight.

Crex.—From the Greek, *krex,* a bird; the Rail.

Cristatus.—Latin. Tufted, combed, crested; wearing a crest.

Crustacea.—From the Latin, *crusta,* a crust. A class of animals whose bodies are enclosed in a covering like the crab.

Cucullatus—Latin. Hooded, cowled.

Cuculus.—Latin. Cuckoo.

Cul-de-sac.—French. A blind alley; literally, a bag bottom.

Cultrate.—From the Latin, *culter,* a knife. Sharp and cutting on the edges.

Cultrirostres.—From the Latin, *culter,* (in the genitive, *cultri,*) a knife, and *rostrum,* beak. Systematic name of a family of Grallatoriæ, characterised by a beak with sharp edges.

Cuneate.—From the Latin, *cuneus,* a wedge; wedge-shaped.

Cuneiform.—From the Latin, *cuneus,* a wedge, and *forma,* form. In the form of a wedge; wedge-shaped.

Cupido.—Latin. Desire, appetite, gluttony.

Curruca.—Latin. A Tom-tit, a Hedge-sparrow.

Curvate.—Bowed, bent.

Curvirostra.—From the Latin, *curvus,* bent, bowed; and *rostrum,* beak. Having the beak bent or bowed.

Cygnus.—Latin. A Swan.

Cypselus.—Latin. A Martin or Swallow.

Dentate.—From the Latin, *dens,* a tooth. Toothed or notched.

Dentirostres—From the Latin *dens,* a tooth, (in the genitive, *dentis,*) and *rostrum,* beak. Systematic name of a family of passerine birds.

Depressor.—Muscles, whose function is to depress certain parts are so called.

Depressed (beak.)—Flattened horizontally

Diaphragm.—From the Greek, *diaphragma,* a partition. The fleshy or muscular partition between the cavity of the chest and cavity of the abdomen.

Diomedea.—The ancient name of certain birds of the island of Diomedes, near Tarentum, which were said to receive the Greeks favourably, and to attack the barbarians. The systematic name of the Albatross.

Disposition.—From the Latin, *dispono,* I place or set in order. Arrangement or placing of parts.

Diurnal.—From the Latin, *dies,* day. Belonging or relating to the day.

Diurnæ.—Systematic name of a division of the birds of prey.

Dolichonyx.—From the Greek, *dolichos,* long, and *onux,* a nail, a claw, Generic name of the Rice Bird.

Domestica.—Latin. Domestic.

Duct (Thoracic.)—The canal or duct which conveys the chyle into the blood.

Echelette.—French. A little ladder. Systematic name of the Creepers.

Emberiza.—Generic name of the Buntings.

Erectile.—From the Latin, *erigere,* to become erect. Susceptible of erection.

Erythacus.—From the Greek, *erithakos*, an unknown bird that was taught to imitate words. The specific name of the Gray Parrot.

Erythrocephalus.—From the Greek *eruthros*, red, and *kephale*, head—Red-head. The systematic name of the Woodpecker.

Esculenta.—Latin. Esculent, edible.

Europæus.—Latin. European.

Excubitor—Latin. One that watches by night. A sentinel.

Extensile.—From the Latin *extendo*, I stretch. Susceptible of being extended or lengthened.

Extensor.—Muscles whose function is to extend certain parts are so called.

Extremities.—From the Latin, *extremus*, extreme; the end of a thing. The limbs; the legs and arms; in birds, the legs and wings.

Falco.—Latin. (Formed from *falx*, in the genitive *falcis*,) a hook, a bill, a scythe. The Falcon, so called from the shape of its beak.

Falconry.—The art of hunting with birds of prey.

Familiaris.—Latin. Familiar. Belonging or relating to a family. Domestic.

Femur.—Latin. The thigh bone.

Ferrugineus.—Latin. Ferruginous. Of the colour of rusty iron.

Ferruginous.—From the Latin, *ferrugo*, rust of iron. Of the colour of iron rust.

Fissirostres.—From the Latin, *fissura*, a slit, a fissure, which is formed from *fendere*, to cleave, to divide, and *rostrum*, a beak. (*Fissure beaks.*) Systematic name of a family of passerine birds.

Fossa.—In the plural, Fossæ. From the Latin, *fodio*, I dig. A cavity of greater or less depth, the entrance to which is always larger than the base. The nasal fossæ are two large cavities, situate between the orbits below the cranium, and lined by the pituitary, or schneiderian membrane; the internal nostrils.

Fourchette.—French. A fork. The notch formed by the coracoid bones and sternum, between the wings.

Fringilla—Latin. A Chaffinch. The systematic name of the Finches.

Front.—The forehead.

Fulica.—Latin. A Coot.

Fulvus.—Latin. Of a deep yellow, or fawn colour.

Function.—From the Latin, *fungor*, I act, or discharge an office. The action of an organ or system of organs.

Fuscus.—Latin. Brown.

Galbula.—Latin. Name of a bird.

Gallinaceæ. — Formed from the Latin, *gallina*, a hen. The systematic name of an order of birds.

Gallinaceous.—Belonging or relating to, or partaking of the nature of the Gallinaceæ.

Gallinago.—Specific name of the Snipe.

Gallinula.—Systematic name of the Water-hens.

Gallinaza.—Spanish. A Turkey-buzzard.

Gallus.—Latin. A Cock.

Garrulus.—Latin. Chattering.

Genus.—Latin. A kindred, breed, race, stock, lineage, or family.

Genera.—Plural of genus.

Generic.—Belonging or relating to genus.

Gerfalcon.—From the Latin, *gyrus*, a circuit, and *falco*, a falcon. The falcon that flies in a circle. A kind of falcon.

Gibbous.—From the Latin, *gibbus*, a bunch or swelling. Bulging or bunching out.

Gizzard. — The strong muscular stomach of a bird.

Glacialis.—Latin. Glacial. Relating to ice.

Gland.—A word applied to designate those softish, granular, lobated organs, composed of vessels, nerves, and a particular structure, which form peculiar secretions.

Glandarius.—Latin. Belonging or relating to acorns.

Glandulosus.–Latin. Full of glands. The *bulbus glandulosus*, is the second stomach of birds.

Glottis.—A small oblong aperture, situate at the upper part of the larynx.

Grallatoriæ. — From the Latin, *grallator*, he that walks on stilts; a stalker. The systematic name of Wading birds.

Granivorous.—From the Latin, *granum*, a grain, (of any kind of corn) and *vorare*, to eat. Grain-eating.

Granule.—A very small grain.

Gregarious.—From the Latin, *gregarius*, of a flock, which is formed from *grex*, (in the genitive, *gregis*) a flock or herd. Going in flocks or herds.

Griffin.—From the Latin, *gryphus*, which is formed from the Greek, *grupos*, curved, hooked. (A fabulous monster, half lion, half bird.) The systematic name of a tribe of birds of prey.

Grus.—Latin. A Crane.

Gryphus.—Latin. A Griffin.

Gypaetos.—From the Greek, *gupaietos*, a kind of eagle; formed from *gups*, a Vulture, and *aietos*, an Eagle.

Gypogeranus.–From the Greek, *gups*, a Vulture, and *geranos*, a bird, (a Crane.) Generic name of the Secretary.

Hæmatopus.—From the Greek, *aimatôpos*, having a fierce or sanguinary look; formed from *aima*, blood, and *ops*, an eye. The generic name of the Oyster-catchers.

Haliætus. — From the Greek, *als*, the sea, and *aietos*, an eagle. The specific name of the Fisher Eagle.

Harpyia—Latin. A harpy. (Formed from the Greek, *arpux*, rapacious.)

Heliaca.—Specific name of a sort of Eagle.

Herbivorous.—From the Latin *herba*, herb or plant, and *vorare*, to eat. Herb-eating. Animals that feed chiefly, or entirely on herbs, or plants, are herbivorous.

Hierofalco.—Latin. Gerfalcon.

Hirundo.—Latin. A Swallow.

Hortulana. — Specific name of a Bunting.

Humerus.—The bone of the arm, which is situate between the shoulder joint and the elbow.

Hyemalis. — Latin. Belonging or relating to winter.

Hyoid.—From the Greek, *u*, and *eidos*, resemblance. Resembling the shape or form of the letter U. The *Os hyoides*, the hyoid bone, is a very moveable bony arch, placed horizontally, in the substance of the soft parts of the neck, at the root of the tongue. It does not articulate with any other bone of the skeleton, and is only connected to it through the medium of muscles and ligaments.

Icterus.—Latin. (Name of a yellow bird, which, if one see, being sick of the yellow jaundice, the person recovers, and the bird dies.) Systematic name of the Oriole.

Iliacus.—Systematic name of a kind of Thrush.

Impennis.—Latin, (formed from *penna*, a wing.) Systematic name of the Penguins which have very short wings.

Imperialis.—Latin. Imperial, royal.

Incubation.—From the Latin, *incubatio*. The act of the female of oviparous animals, in sitting and remaining on her eggs for the purpose of hatching them.

Indigenous.—From the Latin, *inde*, where, and *genitus*, born. Applied to the natives of a country; also, to animals that inhabit the country where they are born.

Ingluvies.–Latin. The crop of a bird.

Insectivorous.—From the Latin, *insecta*, insects, and *vorare*, to eat. Insect-eating. Animals that feed on insects are insectivorous.

Invertebrate.—Without vertebræ.

Iris.—That part of the eye in which the pupil is situate.

Irides.—Plural of Iris.

Islandicus. — Latin. Belonging or relating to Iceland.

Isolate.—(From the Italian, *isola*, an island; because one who is *isolated*, resembles an island entirely surrounded by water.) Separated, alone, single.

Ispida.—Systematic name of a Kingfisher.

Jota.—Specific name of a Vulture.

Jugular.—From the Latin, *jugulum*, the throat. Belonging or relating to the throat.

Kinglet.—A little king. A name of the Wren.

Læmmer-geyer.—German. Lamb-vulture.

Lagopus.—Latin. Ptarmigan.

Lamella.—Latin. A little thin plate or piece.

Lamellæ.—Latin. Plural of Lamella.

Lamellirostres.—From the Latin, *lamella*, a thin plate, and *rostrum*, beak. Systematic name of a family of birds.

Lamina.—Latin. A plate, or thin piece of metal or bone.

Laminæ.—Latin. Plural of Lamina.

Lanius.—Generic name of Shrikes.

Larva.—Latin. A mask. An insect after it has left the egg, and before it assumes the form of a chrysalis, is called a larva, because in this state it is, as it were, masked.

Larvæ.—Latin. Plural of Larva.

Larus.—Latin. A Sea-mew or Gull.

Larynx.—From the Greek, *larugx*, a whistle. The apparatus of voice. It is situate at the superior and anterior part of the neck; and at the top of the trachea, with which it communicates.

Leucocephalus.—From the Greek, *leukos*, white, and *kephale*, head. White-headed. Specific name of the Bald Eagle.

Lithofalco.—From the Greek, *lithos*, a stone, and the Latin, *falco*, a falcon. Specific name of the Merlin.

Lobate (foot)—Toes furnished on the sides with broad plain membranes.

Longipennes.—From the Latin, *longus*, long, and *penna*, a wing. Long-winged. Systematic name of a family of web-footed birds.

Longirostres. — From the Latin, *longus*, long, and *rostrum*, beak. Long-beaked. Systematic name of a family of Waders.

Loon.—The name of a bird, from *loom*, which in the language of the Laplanders, signifies lame, as it cannot walk well.

Lore.—A naked line leading from the beak to the eye.

Loxia.—From the Greek, *loxos*, oblique. Systematic name of the Grosbeaks.

Luscinia.—Latin. A Nightingale.

Macrodactyli. — From the Greek, *makros*, long, and *daktulos*, a finger (toe.) Long-fingered. Systematic name of a tribe of Wading birds.

Mænura, or Mæura.—Generic name of the Lyres. Probably a corruption from the Greek, *pandoura*, a musical instrument resembling a lute.

Major.—Latin. Greater, larger.

Mammal.—Any animal having teats for suckling its young, is called a mammal.

Mandibles.—From the Latin, *mandare*, to chew. The jaws of birds.

Marsupium.—Latin. A pouch, a sac.

Mastication.—From the Greek, *mastichaô*, I chew. The act of chewing food to impregnate it with saliva, and prepare it for the digestion it has to undergo in the stomach.

Melanaetos.—From the Greek, *melanos*, black, and *aetos*, an eagle. A specific name of the Common Eagle.

Meleagris.—Latin. A Turkey.

Membrana.—Latin. A membrane.

Membrane.—A name given to different thin organs, representing species of supple, more or less elastic, webs.

Membranous.—Belonging to membrane.

Mergus.—From the Latin, *mergo*, I put under water. Generic name of the Mergansers.

Merops.—Latin. A bird that eats bees. Generic name of the Bee-eaters.

Merula.—Latin. A Black bird.

Metacarpus—From the Greek, *meta*, after, and *karpos*, the wrist. That part of the hand which is between the wrist and fingers.

Metatarsus—From the Greek, *meta*, after, and *tarsos*, the instep. That part of the foot which is between the instep and toes.

Migration.—The act of going from one country to dwell in another.

Migratoria.
Migratorius. Latin. Migratory.

Migratory.—Having the habit of going from one country to sojourn in another, during a season.

Miliaria.—Latin. A bird that feeds upon millet. Specific name of the common Bunting.

Milvus.—Latin. A Kite.

Minor.—Latin. Less, smaller.

Mollissima.—Latin. Softest.

Mollusca.—From the Latin, *mollis*, soft. A class of marine animals without vertebræ, which have blood vessels, a spinal marrow, and a simple body, without articulated limbs.

Molluscous.–Belonging to Mollusca.

Monedula.—Latin. A Jackdaw.

Monogamous..— From the Greek, *monos*, one, and *gamos*, marriage. Those animals, the male and female of which are paired for life, are said to be monogamous.

Monogamy.—From the Greek, *monos*, one, single; and *gamos*, marriage. The state or condition of being married only to one person.

Motacilla.—Latin. A Wag-tail.

Mouette.—French. A Sea-mew, a Gull.

Moult.—To change the feathers.

Moulting.—Changing of the plumage, which occurs naturally and periodically.

Muscicapa.—From the Latin, *musca*, a fly, and *capio*, I seize. Fly-catcher.

Musicus.—Latin. Belonging or relating to music.

Mustaches.—From the Greek, *mustax*, the upper lip; the beard on the upper lip. The beard that is permitted to grow long on the upper lip. The hairs which many animals have growing about the mouth.

Myothera.—From the Greek, *mus*, a mouse, and *theraô*, I hunt, I catch. The systematic name of the Ant-Catchers. (The word would be better, *myrmothera*, from *murmex*, an ant; and *theraô*.)

Nares.—Latin. The nostrils.

Natation.—From the Latin, *natatio*, swimming. The act of swimming, or supporting one's self, or moving upon the water.

Nectar.—From the Greek, *nektar*, which is formed from *ne*, a negative, and *ktaô*, I kill, because nectar imparted immortality. The drink of the heathen gods. A certain product of flowers, which is found in the corolla, but which does not belong to it.

Nictitans.—Latin. Winking. The membrana nictitans, is a sort of internal eyelid, found in many mammals, and in all birds.

Nidification—From the Latin *nidus*, a nest, and *facere*, to make. The act of building a nest.

Niger.
Nigra. Latin. Black.

Nisus.—Latin. A Sparrowhawk.

Noctua.—Latin. An Owl.

Nocturnæ.— Systematic name of nocturnal birds of prey.

Nostrils, (Linear)—When they are extended lengthwise in a line with the beak, as in Divers, &c.

Nostrils, (Pervious)—When they are open, and may be seen through from side to side, as in Gulls, &c.

Novæ Hollandiæ.—Latin. Of New Holland.

Numida, (Numidica.)—Latin. A Guinea fowl.

Numenius.—From the Greek, *neos*, new, and *mene*, moon, on account of their crescent shaped beak. Generic name of the Curlews.

Œsophagus.—From the Greek, *oisô*, I carry, and *phagein*, to eat. The gullet. The membranous canal, which conveys food from the mouth to the stomach.

Œstrus.—From the Greek, *oistros*, strong desire, incitement; a gad-fly. Systematic name of a family of insects.

Omnivorous.—From the Latin, *omnis*, all, and *vorare* to eat. Applied to animals that eat all kinds of food, both animal and vegetable.

Onocrotalus.—From the Greek *onos*, an ass, and *krotos*, noise. Systematic name of the Pelican.

Operculum.—Latin. Formed from *operire*, to cover. The small door or cover which closes the entrance to a shell. A bony, moveable plate which, in a great many fishes, covers the ears or branchiæ.

Organization.—The mode, or manner of structure of an organized being.

Oriolus.—From the Latin, *aureolus*, of the colour of gold. Systematic name of the Orioles.

Ornithology—From the Greek *ornis*, in the genitive case, *ornithos*, a bird, and *logos*, a discourse. The natural history of birds.

Orphea—Specific name of a Fauvette.

Ortyx.—From the Greek, *ortux*, a quail. Systematic name of a kind of Partridge.

Oryzivora.
Oryzivorus.
Latin. Formed from the Greek, *oruza*, rice, and the Latin, *vorare*, to eat. Specific names of certain Buntings.

Os.—Latin. A bone.

Ossifraga.—Latin. Formed from *ossa*, bones, and *frangere*, to break. Name of a kind of Vulture.

Ossifragus.—Latin. Specific name of an eagle.

Ostralegus.—Latin. Specific name of an Oyster-Catcher.

Otis.—Latin. From the Greek, *ôtis*, a Bustard. Generic name of the Bustards.

Otus.—From the Greek, *ôtos*, an Owl; formed from *ous*, (in the genitive, *ôtos*,) an ear. Generic name of a kind of Owl.

Ovary.—From the Latin, *ovum*, an egg. The ovaries are the organs in which the eggs are formed in oviparous animals.

Oviduct.—The duct or canal which leads from the ovaries to the cloaca.

Oviparous.—From the Latin, *ovum*, an egg, and *parere*, to bring forth. Animals that multiply by means of eggs, are oviparous.

Palati.—Latin. Of the palate.

Palmar.—From the Latin, *palma*, the palm of the hand. Belonging or relating to the palm. Also applied to the feet of web-footed birds.

Palmate.—Having a membrane betwixt the toes, giving the foot a remote resemblance to the palm.

Palmipedes.—From the Latin, *palma*, palm, and *pes*, (in the genitive, *pedis*,) a foot. Systematic name of web-footed birds.

Pancreas.—From the Greek, *pan*, all, and *kreas*, flesh, that is, *quite fleshy*. A gland deeply seated in the abdomen, which resembles the salivary glands in its structure, and has been called the *abdominal salivary gland*.

Pancreatic.—Belonging to the Pancreas.

Pandion.—Generic name of the Ospreys.

Papa.—Specific name of a Vulture.

Papilla.—Latin. A nipple. A name given to small eminences, which appear to be formed by the ultimate expansion of the vessels and nerves.

Papillæ.—Plural of Papilla.

Papillated.—Covered with Papillæ.

Paradisæa.—Generic name of the Birds of Paradise.

Parus.—Generic name of the Tits.

Passerinæ.—From the Latin, *passer*, a Sparrow. The systematic name of migratory birds.

Passerine (Birds)—Birds of passage.

Patagonica.—Latin. Belonging or relating to Patagonia.

Pavo.—Latin. A Peacock.

Pecten.—Latin. A comb. The name given to a folded membrane, situate in the back part of the eye in birds, destined to regulate the focal distance between the crystalline lens and the sentient surface of the retina.

Pectinate (foot.)—From the Latin, *pecten*, a comb. Toes fringed like the teeth of a comb. (See, Plate 7, fig. 2.)

Pectoral.—From the Latin, *pectus*, (in the genitive, *pectoris*) the chest, the breast. Belonging or relating to the chest.

Pelagica.—Latin. Belonging or relating to the sea.

Pelicanus.—Latin. A Pelican.

Pelvis.—Latin. A basin. The name of the bony structure at the lower part of the trunk, which forms the inferior boundary of the abdomen, gives support or place of foundation to the spinal column, and affords points of articulation for the thigh bones, constituting the hip joint.

Peninsula.—From the Latin, *pene*, almost, and *insula*, an island. Land almost surrounded by water, and connected to a continent by a neck of land.

Penultimate.—From the Latin, *pene*, almost, and *ultimus*, the last. That which is immediately next to the last.

Percnopteri.—The plural of Percnopterus.

Percnopterus. — From the Greek, *perknos*, spotted, and *pteron*, wing. Systematic name of certain Vultures.

Pernis.—From the Greek, *pernes*, a certain bird of Prey. The generic name of the Honey-Buzzards.

Petrel.—The diminutive of Peter. The name of a web-footed bird, that seems to walk on the water.

Petrous.—From the Greek, *petra*, a rock, a stone. A part of the temporal bone, which contains the internal organs of hearing, is so called, from resembling a stone in hardness.

Phæton.—From the Greek, *phaethôn*, brilliant. Generic name of the Tropic bird.

Phalacrocorax.—From the Greek, *phalakros*, bald, and *korax*, a Raven. The systematic name of the Cormorants, which latter name is a corruption of the French words, *corbeau marin*, Sea-crow.

Phalanges.—The plural of Phalanx.

Phalanx.—From the Greek, *phalagx*, a file of soldiers. The bones composing the fingers and toes. They are named, first, second, and third phalanges.

Phalaropus.—From the Greek, *phalaris*, a Coot, and *pous*, foot. Having the lobed feet of the Coots. Systematic name of the Phalaropes.

Phalenæ.—From the Greek *phalaina*, a moth, (of the kind that flutter about lamps.) Systematic name of a family of insects.

Phasianus.—From the Greek, *phasianos*, a Pheasant, so called from the river Phasis, in Colchis, near the Black Sea. The systematic name of the Pheasants.

Phœnicopterus.—From the Greek, *phoinix*, red, and *pteron*, wing. Red-winged. The generic name of the Flamingo.

Pica.—Latin. A Magpie.

Picus.—Latin. A Woodpecker.

Pictus.—Latin. Painted, speckled, spotted.

Pilaris.—Latin. Belonging to anything round. The specific name of a Thrush.

Pinion.—The joint of the wing remotest from the body.

Pinnate (foot.)—Having the edges of the toes scalloped or notched, as in the Coots.

Pintado.—Spanish. Mottled. Generic name of the Guinea fowl.

Piscivorous.—From the Latin, *piscis*, a fish, and *vorare*, to eat. Fish-eating. Applied to animals that feed on fish.

Platalea.—Latin. (Formed from the Greek, *platus*, flat.) The Generic name of the Spoonbills.

Plotus.—From the Greek, *pluô*, I swim. The generic name of the Darters.

Plover.—From the Latin, *pluvia*, rain. A bird so called, from making its appearance in the rainy season.

Plumage.—From the Latin, *pluma*, a soft feather. The feathery coat of a bird.

Plume.—Feather of a bird.

Podiceps.—The Generic name of the Grebes.

Polygamous—From the Greek, *polus*, many, and *gamos*, marriage. When animals do not live in pairs, but on the contrary, an individual is united to several of the opposite sex, they are said to be polygamous.

Polyglottus. — From the Greek, *polus*, many, and *glôssa*, tongue. Many-tongued. Specific name of the Mocking bird.

Pratensis. — Latin. Belonging or relating to a meadow.

Prehensile. — Endowed with the power of seizing hold of. Applied to certain parts.

Prehension.—From the Latin, *prehendere*, to lay hold of. The prehension of aliments consists in laying hold of, and conveying food into the mouth.

Pressirostres. — From the Latin, *pressus*, pressed, and *rostrum*, beak. Systematic name of a family of Grallatoriæ.

Prey.—Food gotten by violence.

Primaries, (Primary quills.)—The largest feathers of the wings.

Procellaria.—From the Latin, *procella*, a great tempest at sea. Systematic name of the Petrels.

Prognostic.—From the Greek, *pro*, before, and *ginoskô*, I know, I judge. A conjecture or opinion of what is yet to happen.

Projectile.—From the Latin, *projicere*, to throw in advance, or to a distance. Any heavy body thrown into the air, and abandoned to the action of its own weight. That which is capable of being cast or thrown forward. Having the power of sudden extension.

Protractile. — Capable of being drawn out, or extended.

Proventriculus.—From the Latin, *pro*, before, and *ventriculus*, a little stomach. The second stomach of birds.

Psittacus.—From the Greek, *psittakos*, a Parrot. Systematic name of Parrots.

Psophia.—From the Greek, *psophia*, I make a noise. Systematic name of the Trumpeters.

Pulverator.—From the Latin, *pulverare*, to cover with dust. Applied to those birds that wallow in the dust.

Pygargus.—From the Greek, *puge*, behind, and *argos*, white. A bird of prey with a white tail.

Pylorus.—From the Greek, *pule*, a gate, and *ouros*, a guardian. The lower, or right orifice of the stomach.

Pyrgita.—Generic name of the Sparrows.

Pyrrhula.—Generic name of the Bullfinches.

Quiscalus.—Generic name of the Blackbirds.

Radius.—Latin. A spoke—so called from its shape—one of the bones of the fore-arm.

Rallus.—Generic name of the Rails.

Ramphastos.—From the Greek, *ramphos*, a beak. Generic name of the Toucans.

Rapaces.—From the Latin, *rapax*, ravenous, devouring. Systematic name of the order of birds of prey.

Retrices.—From the Latin, *rectrix*, a governess. The long feathers of the tail which serve to steer the bird.

Recurvirostra. — From the Latin, *recurvo*, I bend back, and *rostrum*, beak. Systematic name of birds whose beaks are curved upwards.

Regimen—Diet.

Regulus.—Latin. Diminutive of *rex*, a king. A Wren.

Regurgitate.—The return of food to the mouth after it has been once swallowed.

Religiosa.—Latin. Religious.

Remiges.—The strong feathers of the wings.

Reticulated.—In the form of the meshes of a net; made of net work.

Retractile.—Having the quality of being drawn back.

Rhea.—Specific name of an Ostrich.

Rhynchops.—From the Greek, *rugchos*, beak, a snout. The systematic name of the skimmers.

Rodentia.—From the Latin, *rodere*. to gnaw. The systematic name of an order of mammals.

Roitelet.—French. Diminutive of *roi*, a king. A Wren.

Ruber.—Latin. Red.

Rubicola. — Specific name of the Stonechat.

Rufus.—Latin. Reddish yellow.

Rupicola.—From the Latin, *rupes*, (in the genitive, *rupis*,) a rock, and *colere*, to inhabit. Generic name of Cocks of the Rock.

Rustica.—Latin. Rustic; belonging to the country.

Rusticola.—Specific name of the Woodcock.

Sarcoramphus. — From the Greek, *sarx*, (in the genitive, *sarkos*,) flesh, and *ramphe*, knife: cutting flesh like a knife. Generic name of a kind of Vulture.

Saxicola.—From the Latin, *saxus*, a rock, and *colere*, to inhabit. Systematic name of a genus of Warblers.

Scansoriæ.—Formed from the Latin, *scando*, I climb. Systematic name of the order of climbing birds.

Scapula.—The shoulder blade.

Scapulars (Scapularies)—The feathers that take their rise from the shoulders, and cover the sides of the back.

Scolopax.—From the Greek, *skolopax*, a Snipe. Generic name of the Snipe.

Scops.—From the Greek, *skôps*, an Owl. The systematic name of an Owl.

Scutellated (legs.)—Formed from the Latin, *scutum*, a shield. Having the tarsi covered with scaly plates.

Secondaries.—Those quills that rise from the second bones of the wing.

Sedentary.—Not migratory.

Serpentarius.—Latin. Belonging or relating to serpents. Specific name of the Secretary or Serpent bird.

Serrated.—From the Latin, *serra*, a saw. Notched or toothed like a saw.

Sitta.—From the Greek, *sittô*, I cry. Generic name of the Nuthatches.

Somateria.—Systematic name of the Eider.

Sterna.—Systematic name of the Terns or Sea Swallows.

Sternum.—The breast bone.

Strix.—Latin. An Owl.

Struthio.—From the Greek, *strouthiôn*, an Ostrich. Systematic name of the Ostrich.

Sturnus.—Latin. A Starling.

Styloid.—From the Greek, *stulos*, a style, a peg, a pin, and *eidos*, resemblance, shape. Shaped like a peg or pin.

Subbuteo.—From the Latin, *sub*, under, next, after, and *buteo*, a kind of Hawk. Specific name of a Falcon.

Submaxillary—From the Latin, *sub*, under, and *maxilla*, jaw. That which is beneath the jaw.

Sula.—From the Greek, *sula*, plunder, booty. Generic name of the Boobies.

Sylvia.—Generic name of certain Warblers.

Syndactylæ.—From the Greek, *sun*, together, and *daktulos*, toe. Having the toes joined. Systematic name of a family of passerine birds.

Syrnium.—From the Greek, *surnion*, an owl. Systématic name of the Hooting Owls.

Tachypetes.-From the Greek, *tachus*, swift, and *petomai*, to fly. Systematic name of the Frigate bird.

Talon.—The claw of a bird of prey.

Tanagra.—Systematic name of the Tanagers.

Tarda.—Latin. Slow, tardy.

Tarsi.—Plural of tarsus.

Tarsus.—From the Greek, *tarsos*, any row, the sole of the foot. The posterior part of the foot, which, in man, consists of seven bones, and forms the heel and instep.

Tectiform.—From the Latin *tectum*, roof of a house, and *forma*, form. Roof-shaped.

Tegumentary.—From the Latin, *tegumen*, a covering. Belonging or relating to the tegument or skin.

Tenuirostres.—From the Latin, *tenuis*, slender, and *rostrum*, beak. Systematic name of a family of passerine birds.

Tetrao.—Latin. A Bustard. Systematic name of Grouse.

Tetrax.—Greek. Systematic name of the Bustard.

Thorax.—From the Greek, *thôrax*, the chest. It is bounded posteriorly by the vertebræ; laterally, by the ribs and scapula; anteriorly, by the sternum; above, by the clavicle; and below by the diaphragm. It is destined to lodge and protect the chief organs of respiration and circulation:—the lungs and heart.

Thoracic.—Belonging to the thorax.

Tibia.—Latin. A flute. The largest bone of the leg is so called.

Tichodroma.—Systematic name of certain Creepers.

Torda.—Specific name of a kind of Auk.

Torquilla.—From the Latin *torqueo*, I writhe, I twist. Systematic name of the Wryneck.

Totipalmatæ.—From the Latin *totus*, the whole, and *palma*, the palm. Systematic name of a family of web-footed birds.

Trachea.—From the Greek, *trachus*, rough, and *arteria*, an artery, which is formed from *aer*, air, and *terein*, to keep. The canal which conveys the air to the lungs. The windpipe.

Trenchant.—Cutting.

Tristis.—Latin. Sad, sorrowful.

Trochilus.—Systematic name of the Humming-birds.

Troglodytes.—From the Greek, *trogle*, a cavern or hole, and *duô*, I enter. Systematic name of the Wrens.

Trunk.—The body without including the head or extremities. The proboscis of an Elephant.

Truncated.—Cut short. Cut abruptly, or square off.

Tubercle.—From the Latin, *tuber*, a knot; a small knot or projection.

Turdus.—Latin. A Thrush.

Tyrannus.—Latin. A tyrant.

Ulna.—The bone of the fore-arm, which forms the prominence of the elbow, during the flexion of that joint.

Ulnar.—Relating to the ulna.

Ulula.—Latin An Owl.

Umbellus.—Latin. Specific name of the ruffed Grouse.

Upupa.—Latin. A Hoopoo.

Urbica.—Latin. Belonging or relating to a city.

Ureter.—The tube or canal, which passes from the kidney to the bladder.

Uria.—Generic name of the Guillemots.

Urogallus.—Specific name of the great Heath Cock.

Valesneria.—Generic name of an aquatic plant, Channel Weed, upon which the Canvass back ducks feed, and to which the peculiar and delicious flavour of their flesh, is said to be attributable. The specific name of the Canvass back duck.

Vanellus.—Generic name of the Lapwing.

Velum.—Latin. A veil.

Ventricle.—The second stomach of a bird is so called.

Versicolor.—Latin. Changing colour; of various colours.

Vertebra.—From the Latin, *vertere*, to turn. This name has been given to each of the bones, which, by their union, form the vertebral or spinal column, vulgarly called the back bone.

Vertebræ.—The plural of vertebra

Vertebral.—Belonging or relating to vertebræ.

Vertebrata.—Animals that possess vertebræ. The first branch of the Animal kingdom.

Vertebrate.—Having vertebræ.

Vestibule.—From the Latin, *vestibulum*, vestibule. A room at the entrance of an edifice, which only serves as a passage to other apartments. The first part of the second cavity of the ear is so called.

Vibrissæ.—Hairs that stand forward like feelers; in some birds they are slender, as in Fly-catchers, &c. and point both upwards and downwards, from both the upper and under sides of the mouth.

Virginiana. } Latin, Belonging
Virginianus. } to Virginia.

Viscera.—The plural of viscus.

Viscus.—Any bowel or entrail, or internal part, as the heart, liver lungs, pancreas, &c.

Viscivorus.—Systematic name of a Thrush.

Vociferus.—Latin. Vociferous, noisy, crowing.

Vultur.—Latin. A Vulture.

Vulturinus.—Latin. Belonging or relating to a Vulture.

Wattle.—The loose, red flesh that hangs below a Cock's bill.

Yunx.—From the Greek, *xunx*, the Wryneck. Generic name of the Wrynecks.

Zoological.—Belonging or relating to Zoology.

Zoology.—From the Greek, *zôon*, an animal, and *logos*, a discourse. That part of natural history which treats of animals.

Zygodactylæ.—From the Greek, *zugos*, a balance, and *daktulos*, a toe. Systematic name of the order of Climbers.

FINIS.

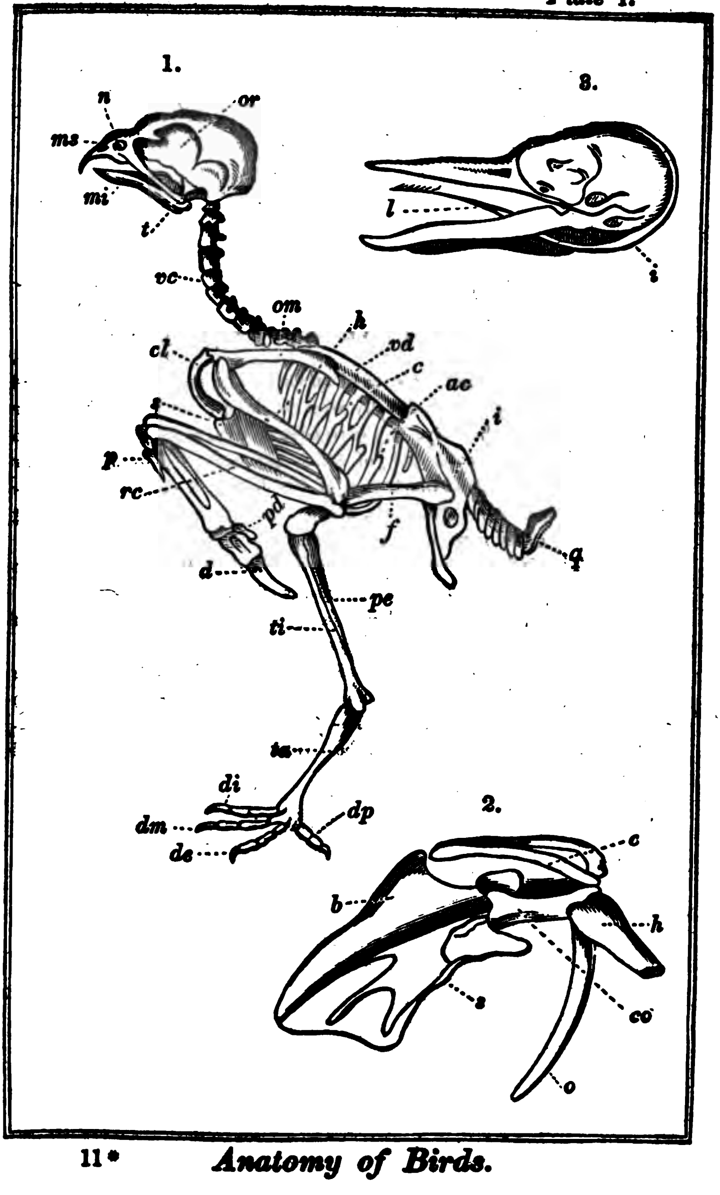
EXPLANATION OF PLATE I.

Fig. 1. Skeleton of a bird seen in profile—*ms*, superior or upper mandible—*mi*, lower mandible—*n*, the nasal fossæ—*t*, the tympanic bone—*or*, the orbit—*vc*, cervical vertebræ—*vd*, dorsal vertebræ—*q*, vertebræ of the tail —*c*, the ribs—*ac*, costal appendices—*s*, sternum—*om*, the scapula—*cl*, the clavicle—*h*, the humerus—*rc*, the radius and cubitus or ulna—*p*, the thumb *d*, the median finger—*pd*, rudiment of the thumb—*i*, the iliac bones, which form the pelvis—*f*, the femur—*ti*, tibia—*pe*, the fibula—*ta*, the tarsus —*di*, the internal toe—*dm*, median toe—*de*, external toe—*dp*, posterior toe.

Fig. 2. The sternum and bones of the shoulder—*s*, the sternum—*b*, the brisket or keel—*c*, the clavicles—*co*, the coracoid bone—*o*, the scapula—*h*, a part of the humerus.

Fig. 3. The head of a wood-pecker to show the position of the tongue, (*l*,) and the horns of the hyöid bone (*i*), passing from below over the back part of the head.

Plate 1.



Anatomy of Birds.

EXPLANATION OF PLATE 2.

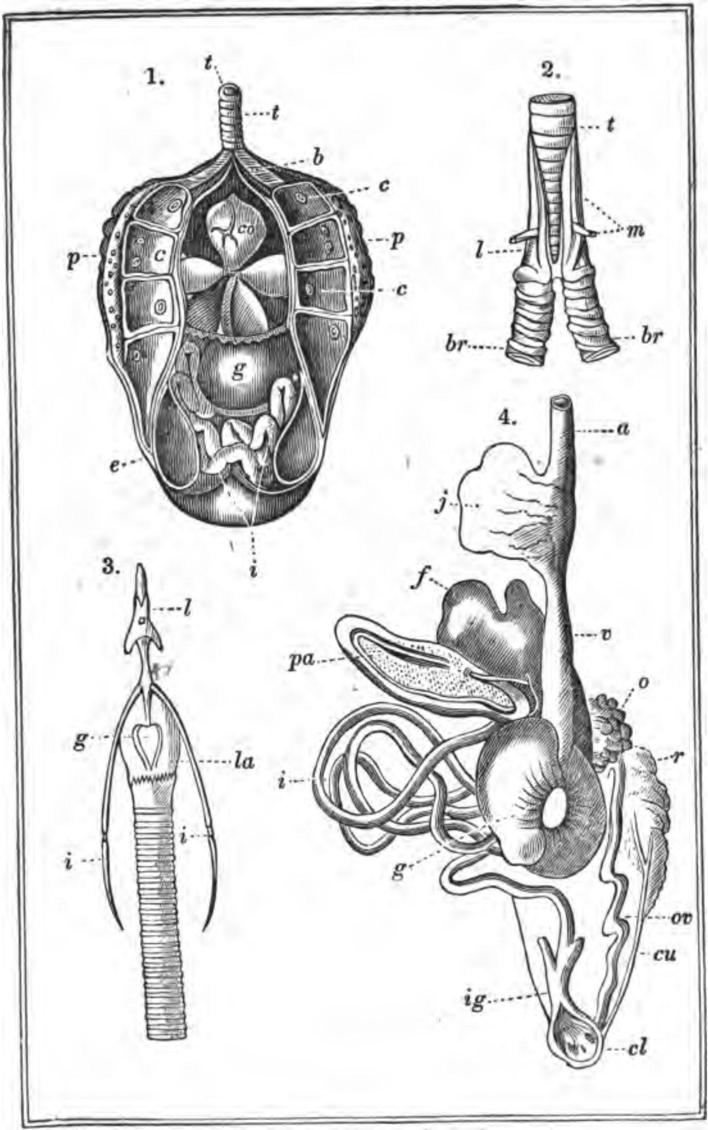
Fig. 1. The thorax and abdomen of an Ostrich, opened to show the great air cells which communicate directly with the lungs, and transmit the air to different parts of the body. *t*, the trachea or wind-pipe—*b*, the bronchiæ—*pp*, the lungs, the greater part of which are concealed by the great air cells—*c*, *c*, *c*, *c*, air cells at the bottom of which may be perceived the openings of the bronchiæ—*e*, other cells, which communicate with the preceding *co*, the heart—*g*, the gizzard—*i*, the intestines.

Fig. 2. The inferior larynx of a singing bird—*t*, the trachea—*br*, the bronchiæ—*l*, the inferior larynx—*m*, muscles of the vocal apparatus.

Fig. 3. The tongue and trachea of a bird—*l*, the tongue—*i*, the cornu of the os hyoïdes—*la*, the superior larynx—*tr*, the trachea—*g*, the glottis.

Fig. 4. The digestive apparatus of a pigeon—*a*, the œsophagus—*j*, the ingluvies or crop,—*v*, the proventriculus or bulbus glandulosus (*See page* 21.)—*g*, the gizzard—*i*, the small intestine—*ig*, the large intestine—*f*, the liver—*pa*, the pancreas—*o*, the ovary—*ov*, the oviduct—*r*, the kidneys—*cu*, canal of the ureter—*cl*, the cloaca.

Plate 2.



Anatomy of Birds.

EXPLANATION OF PLATE 3.

		(Generic names.)	
Fig.	1. Eagle.	*Falco.*	Order of Rapaces, or Birds of Prey.
	2. Eared Owl.	*Otus.*	
	3. Griffin.	*Gypaetos.*	
	4. Percnopterus.	*Percnopterus.*	
	5. Great Horned Owl.	*Strix.*	
	6. Vulture.	*Vultur.*	
	7. Falcon.	*Falco.*	
	8. Kite.	*Milvus.*	
Fig.	9. Ortolan.	*Emberiza.*	Order of Passerinæ.
	10. Kingfisher.	*Alcedo.*	
	11. Humming-bird.	*Trochilus.*	
	12. Calao.	*Buceros.*	

Plate 3.

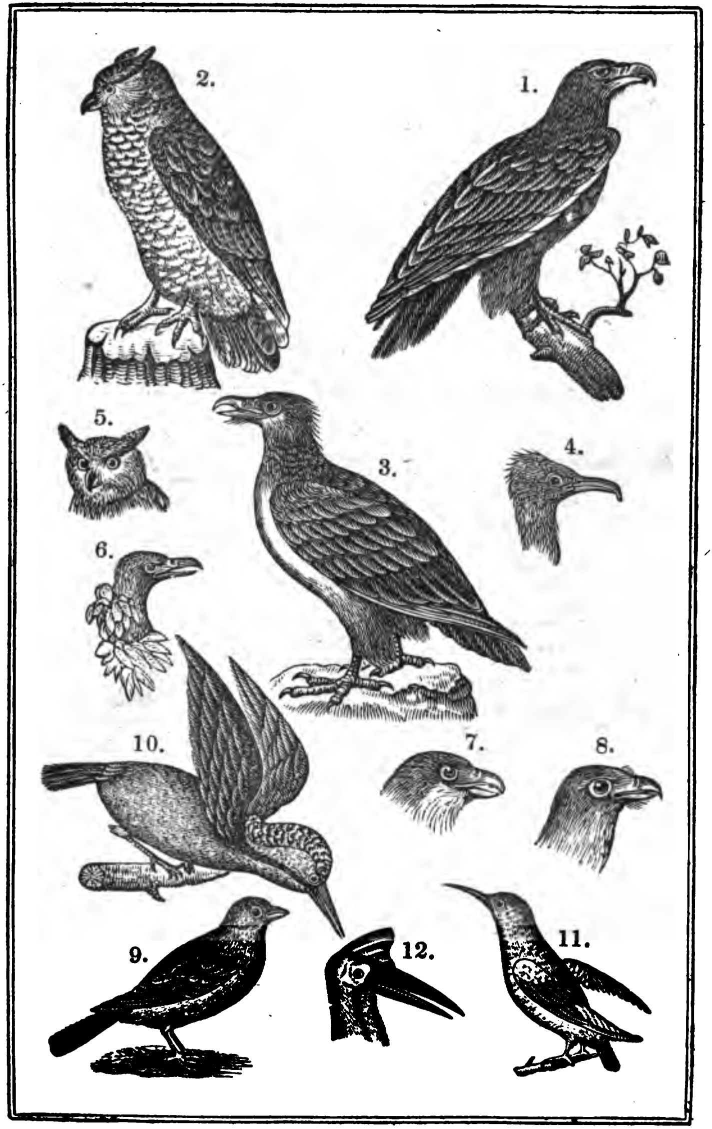


Fig.* 1 *to* 8.—*Order of Rapaces.
Fig.* 9 *to* 12.—*Order of Passerinæ.

EXPLANATION OF PLATE 4.

		(Generic Names.)	
Fig.	1. Swallow.	*Hirundo.*	Order of Passerinæ.
	2. Goatsucker.	*Caprimulgus.*	
	3. Crossbill.	*Loxia.*	
	4. Lark.	*Alauda.*	
Fig.	5. Wryneck.	*Yunx.*	Order of Scansoriæ.
	6. Cuckoo.	*Cuculus.*	
	7. Maccaw.	*Ara.*	
	8. Cockatoo.	*Psittacus.*	
	9. Woodpecker.	*Picus.*	
	0. Toucan.	*Ramphastos.*	
Fig.	11. Pheasant.	*Phasianus.*	Order of Gallinaceæ.
	12. Hocco.	*Alector.*	

Plate 4.

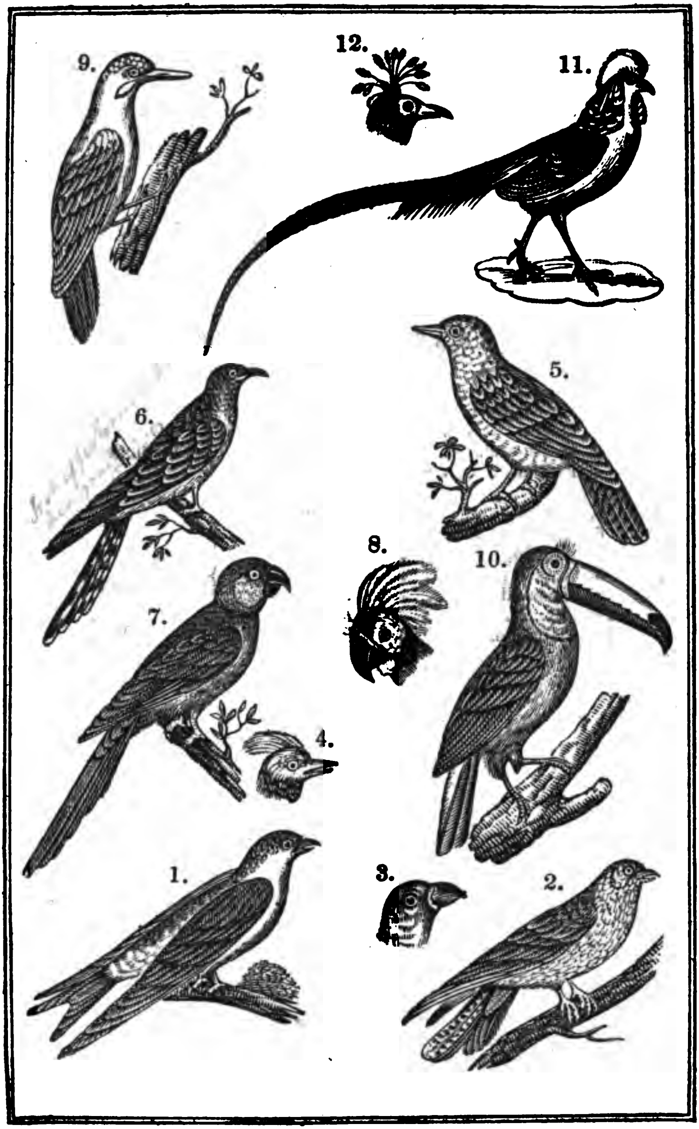


Fig. 1 *to* 4.—*Order of Passerinæ.*
Fig. 5 *to* 10.—*Order of Scansoriæ.* *Fig.* 11 *to* 12.—*Order of Gallinaceæ.*

EXPLANATION OF PLATE 5.

			(Generic names.)	
Fig.	1.	Guinea-fowl.	*Numida.*	Order of Gallinaceæ.
	2.	Quail.	*Coturnix.*	
	3.	Heath-cock.	*Tetrao.*	
	4.	Pigeon.	*Columba.*	
Fig.	5.	Ostrich.	*Struthio.*	Order of Grallatoriæ.
	6.	Plover.	*Charadrius.*	
	7.	Lapwing.	*Vanellus.*	
	8.	Stork.	*Ciconia.*	
	9.	Spoonbill	*Platalea.*	
	10.	Ibis.	*Ibis.*	
	11.	Flamingo.	*Phœnicopterus.*	

Plate 5.

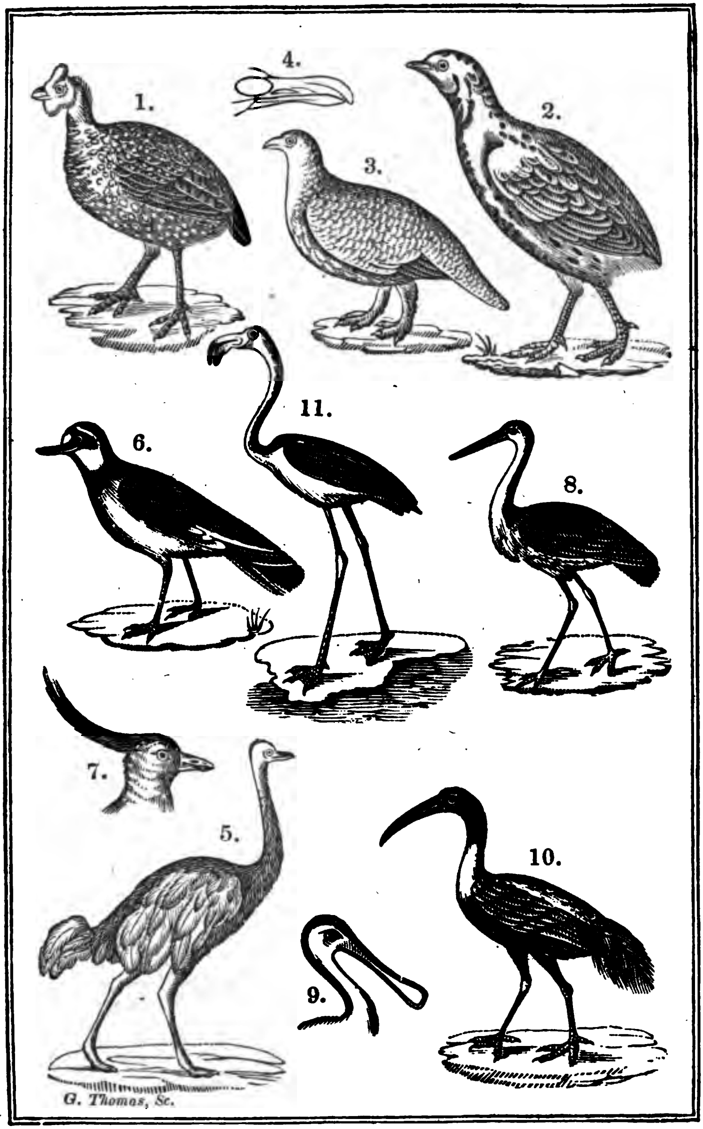
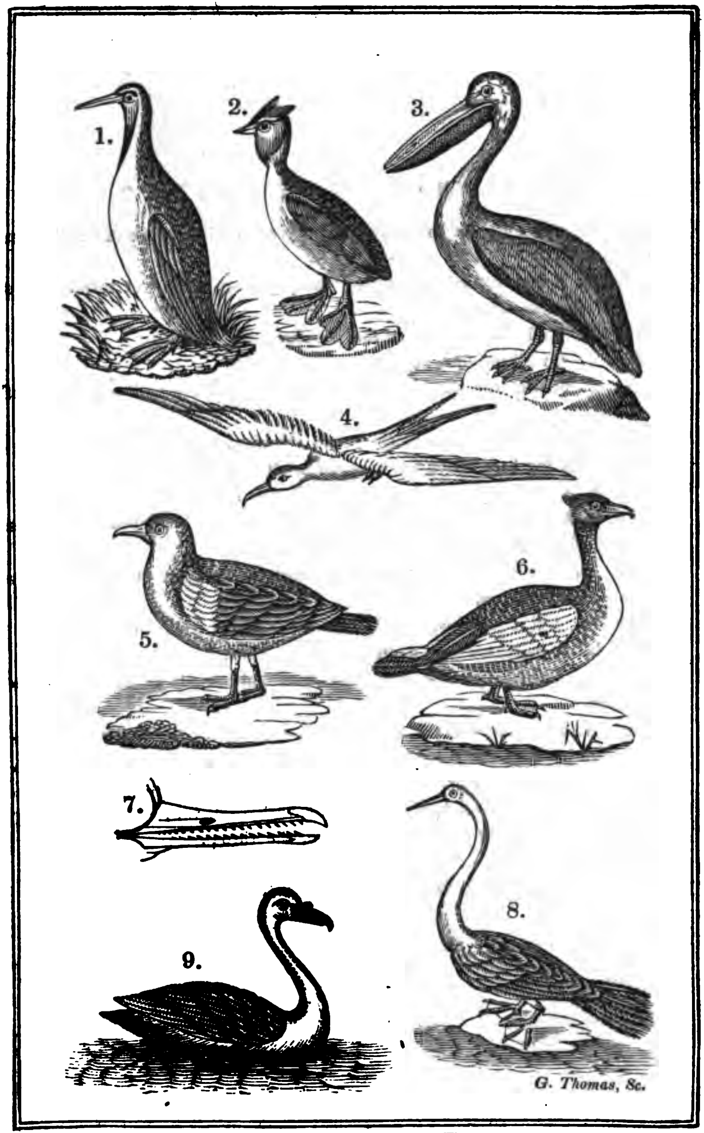


Fig. 1 *to* 4.—*Order of Gallinaceæ.*
Fig. 5 *to* 11.—*Order of Grallatoriæ.*

EXPLANATION OF PLATE 6.

		(Generic names.)	
Fig.	1. Penguin.	*Aptenodytes.*	Order of Palmipedes.
	2. Grebe.	*Podiceps.*	
	3. Pelican.	*Pelicanus.*	
	4. Frigate bird.	*Tachypetes.*	
	5. Gull.	*Larus.*	
	6. Duck.	*Anas.*	
	7. Merganser.	*Mergus.*	
	8. Darter.	*Plotus.*	
	9. Swan.	*Cygnus.*	

Plate 6.



G. Thomas, Sc.

Fig.* 1 *to* 9.—*Order of Palmipedes.

EXPLANATION OF PLATE 7.

Fig. 1. A foot formed for walking and perching, claws retractile; as in the genus Falco.

Fig. 2. A foot formed for walking and perching, claws not retractile, as in the Gallinaceous tribe.

Fig. 3. A climbing foot as in the Woodpeckers,—Picus.

Fig. 4. A walking foot, as in the genus Corvus.

Fig. 5. Foot of the King-fisher, showing the situation and connection of the toes.

Fig. 6. A spurred leg, as in the genus Phasianus.

Fig. 7. A leg bare above the knee, as in all the Waders.

Fig. 8. A semi-palmated foot, as in the genus Ardea.

Fig. 9. A pinnated foot, with the edges of the toes scalloped, as in the genera Fulica, Phalaropus.

Fig. 10. A lobated foot, the toes margined by membranous edgings, as in the genus Podiceps.

Fig. 11. A three-toed webbed foot as in the genus Alca, Uria.

Fig. 12. A palmated foot, as in the genera Anas, Recurvirostra.

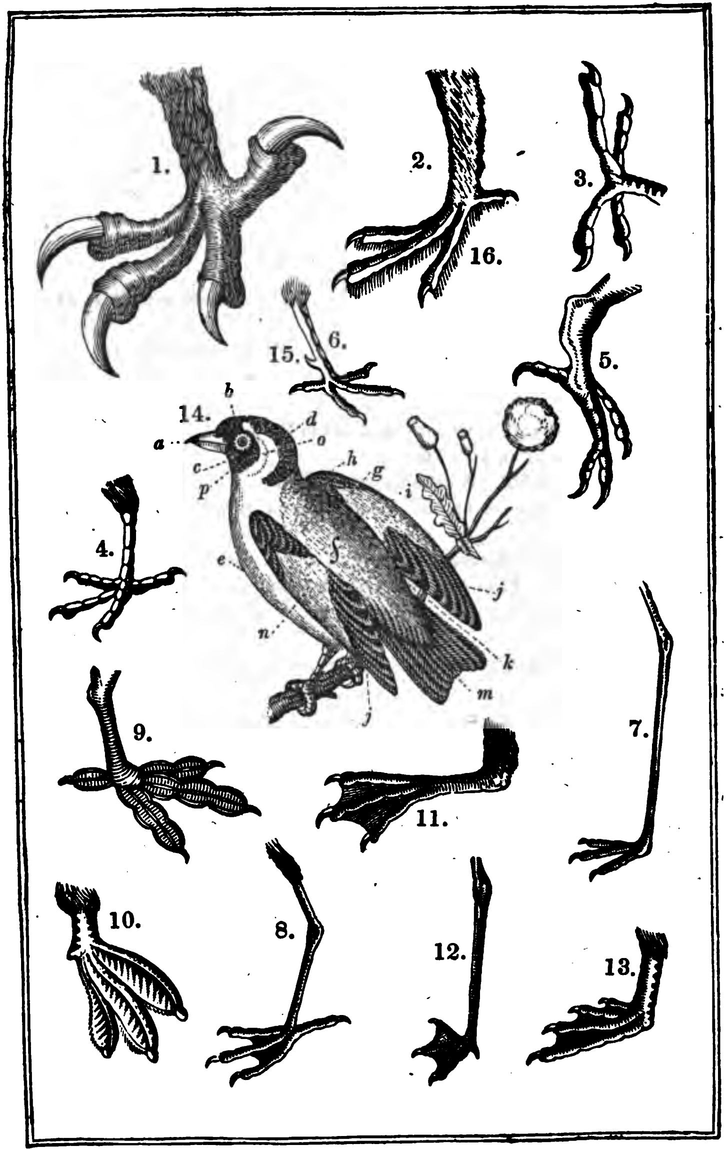
Fig. 13. A palmated foot, with four toes connected, as in the genus Pelicanus.

Fig. 14. The Goldfinch; *a*, beak or bill,—*b*, the front,—*c*, the cheek,—*d*, the hind-head, or occiput,—*e*, the breast,—*f*, the back,—*g*, spurious wing,—*h*, shoulder, and lesser wing coverts,—*i*, secondary quill feathers,—*j*, *j*, greater quill feathers,—*k*, tertials,—*l*, tail coverts,—*m*, tail,—*n*, great wing coverts,—*o*, auricles or auditory conch,—*p*, the throat.

Fig. 15. A spur.

Fig. 16. A pectinated foot, as in the genus Tetrao.

Plate 7.



Anatomy.—Feet.

EXPLANATION OF PLATE 2.

Fig 1. A hooked bill as in the genus Falco. Cere, a bare soft skin at the base of the bill, Fig. 15.

Fig. 2. A serrated or notched bill, as in the genus Ramphastos.

Fig. 3. A cultrated bill, as in the genus Corvus. Reflected vibrissæ. Fig. 16.

Fig. 4. A cuneated or wedge-shaped bill, as in the genus Picus. A cylindrical or extensile tongue, Fig. 17.

Fig. 5. A curvated bill. An erected crest. Fig 18.

Fig. 6. Nostrils covered by, or contained in a tube, as in the genus Procellaria.

Fig. 7. A straight, compressed, cultrated bill. Lore, a bare skin surrounding the eyes, Fig. 20. Projecting edge of the upper mandible, by means of which the birds, whose beaks are thus constructed, cut their food as with scissors, Fig. 24.

Fig. 8. A hooked notched bill, as in the genus Lanius, (Shrike,) the notch, Fig. 21.

Fig. 9. A recurved bill, as in the genus, Recurvirostra.

Fig. 10. A grooved bill, as in the genus Alca.

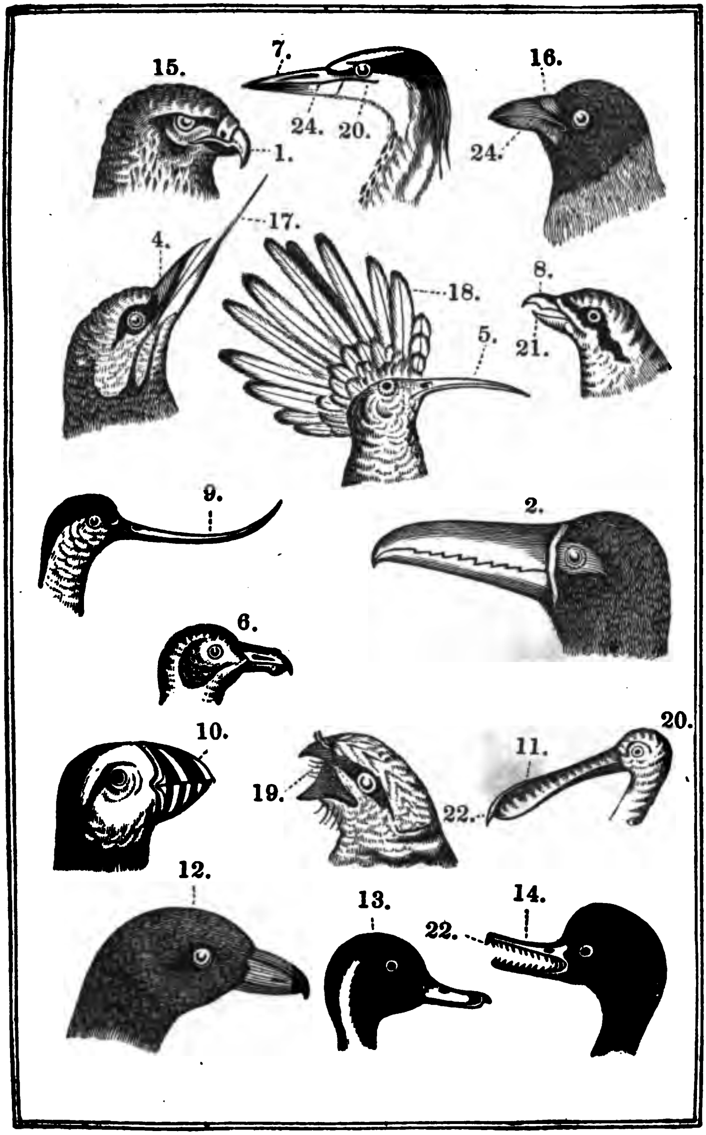
Fig. 11. A spoon-shaped bill, as in the genus Platalea. Nail at the tip of the bill, Fig. 22.

Fig. 12. A compressed bill, as in Geese.

Fig. 13. A depressed bill, as in Ducks.

Fig. 14. A serrated or toothed bill, as in the genus Mergus.

Plate 8.



Anatomy.—Beaks.

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